

THE SOCIETY FOR THE ADVANCEMENT  
OF  
**JOURNAL**  
MANAGEMENT



**Announcement of Eastern Regional Convention**

*December Conference Papers on*  
**Training and Selection of Workers**  
**The Future Relations of Government to Business**  
**Performance of a Package Delivery Truck**

**An Appraisal of the Possibility of Plenty**

**Engineering Societies Building**  
**29 W. Thirty-Ninth St.**  
**New York**

**MARCH, 1936**

**VOL. I, No. 2**

## EXECUTIVE COUNCIL

### *Board of Directors*

*President and Director*.....ORDWAY TEAD  
*Vice-President and Director*.....WM. H. GESELL  
*Secretary and Director*.....DAVID B. PORTER  
*Treasurer and Director*.....OTTO F. TAYLOR  
*Director*.....G. W. BARNWELL  
*Director*.....HENRY P. DUTTON  
*Director*.....JOHN J. FURIA  
*Director*.....H. S. PERSON  
*Director*.....CHARLES G. SMITH

### *Operating Vice-Presidents*

*Student Branches*.....G. W. BARNWELL  
*Education*.....HUGO DIEMER  
*Chapter Organization*.....M. A. DITTMAR  
*Government*.....PERRY A. FELLOWS  
*Professional Development*.....W. S. FORD  
*Research*.....L. M. GILBRETH  
*Membership*.....V. S. KARABASZ  
*Eastern Region*.....R. H. LANSBURGH  
*Costs*.....ROBERT TEVIOT LIVINGSTON  
*Western Region*.....GEORGE T. TRUNDLE, JR.

and

*President, Boston Chapter*.....ALBERT S. CROCKETT  
*President, New York Chapter*.....WALTER K. PORZER  
*President, Northern New Jersey Chapter*.....KENNETH MACGRATH  
*President, Philadelphia Chapter*.....J. A. PARTON  
*President, Washington, D. C., Chapter*.....PERRY A. FELLOWS

### *Advisory Council*

J. G. ALDRICH  
 CARLE M. BIGELOW  
 FESSENDEN S. BLANCHARD  
 ERNEST G. BROWN  
 PERCY S. BROWN  
 ROBERT W. BRUERE  
 JOHN M. CARMODY  
 HELEN A. CARNES  
 EDWARD W. CLARK, 3D  
 MYRON H. CLARK  
 MORRIS L. COOKE  
 ARTHUR T. DAVENPORT  
 HENRY S. DENNISON  
 ALBION N. DOE  
 H. P. DUTTON  
 RICHARD A. FEISS

W. S. FORD  
 BENJAMIN A. FRANKLIN  
 GEORGE E. FRAZER  
 WALTER D. FULLER  
 FRANCIS GOODELL  
 CHAS. B. GORDY  
 HUDSON B. HASTINGS  
 J. C. HECKMAN  
 MILTON C. HERRMANN  
 HARRY ARTHUR HOPF  
 WILLARD E. HOTCHKISS  
 RAY M. HUDSON  
 W. M. C. KIMBER  
 B. EUGENIA LIES  
 ROBERT T. LIVINGSTON  
 J. W. MARDER

DWIGHT V. MERRICK  
 A. H. MOGENSEN  
 HADAR ORTMAN  
 V. M. PALMER  
 JOSEPH W. ROE  
 HENRY ADDISON SCHELL  
 F. R. SHANLEY  
 HENRY WOOD SHELTON  
 JOHN C. SHOVER  
 IDA M. TARBELL  
 SANFORD E. THOMPSON  
 MARY VAN KLEECK  
 F. W. VAN NESS  
 L. W. WALLACE  
 A. WEINSTEIN  
 JOHN H. WILLIAMS

### *Editorial Committee*

HENRY P. DUTTON      JOHN J. FURIA      HARLOW S. PERSON  
                                  DAVID B. PORTER      ORDWAY TEAD

### *Office Manager and Assistant Editor*

EVELYN BUCKLEY, Room 611, 29 West 39th Street, New York, N. Y.

L  
R  
R  
S  
D  
H  
Z  
H  
N  
R.





# THE SOCIETY FOR THE ADVANCEMENT OF MANAGEMENT JOURNAL \*

Published by the Society for the Advancement of  
Management, Inc., at

Engineering Societies Building  
29 West Thirty-Ninth St., New York

The Journal of the Society for the Advancement of Management is included in the indexing of the Industrial Arts Index which is obtainable at Public Libraries.

The reprint of extracts up to 50 per cent of the whole of any article herein is authorized, provided the source is mentioned. In return the Society appreciates complimentary copies of the publications containing such reprints. Permission to reprint more than 50 per cent must be arranged through the office of the Society.

Copyrighted 1936, by the Society for the Advancement of Management, Inc. Published every other month. Per year to Members \$2.50; to others \$3.00. This issue \$.75.

Entered as second-class matter at the Post Office at New York, N. Y., under the Act of March 3, 1879.

\* Formerly the BULLETIN OF THE TAYLOR SOCIETY AND OF THE SOCIETY OF INDUSTRIAL ENGINEERS

Vol. I                      MARCH, 1936                      No. 2

## Contents

Comment . . . . .	29
Training and Selection of Workers . . . . .	31
By Ralph W. Langley and John R. Edwards	
Discussion by King Hathaway	
The Future Relations of Government to Business . . . . .	37
By H. S. Person	
The Development of a Standard of Measurement for the Performance of a Package Delivery Truck . . . . .	42
By E. Willis Whited	
Eastern Regional Convention . . . . .	49
An Appraisal of the Possibility of Plenty	50
Reviews . . . . .	59

## Comment

**B**ACK to fundamentals—is a phrase likely to repel those who by temperament want to advance to something new.

We'll try anything once—is perhaps the attitude of the opposite temperament.

Between these extremes when we meet them in the world of management is there no middle course? Is the backward look or the experimental outlook to be preferred?

The answer surely is that the two have to be combined, that they can really be supplementary and mutually supporting attitudes of mind.

There are fundamentals in management. There is a body of tested and proved general principles which have been capable of wide application in organizations of many kinds. To a considerable degree the world is indebted to Frederick W. Taylor for insisting that a scientific approach to this field would yield an organized body of general truths. The answer is that it has.

In the analysis of functions, in determining the right structure for organizations, in the control of operations, the establishment of standards both for methods and for results,—the gains have been impressive. The volume entitled "Scientific Management in American Industry," edited by Dr. Harlow S. Person (1929) has given a fundamental statement of the fruition of the work of Mr. Taylor and others. The approach to the management problem has been established. It is summarized in that volume under four heads—research, standards, control and maintenance.

The late W. H. Leffingwell similarly epitomized the scientific approach in his summary "Five Principles of Effective Work" with the words,—plan, schedule, execute, measure, reward.

No organization can pretend to do a good job managerially, if it does not go back to fundamentals in this sense; and do this not once but continuously.

At least one-half of the justification for a society to advance management is its educational value in helping more and more organizations to an intelligent application of sound principles. Too often the application has been piece-meal. We find a well-managed production department but a poorly co-ordinated sales department. Or the reverse.

Accounts of successful applications are of great assistance. We need more of them. We learn most readily by example. And we need to be reminded of the need for a consistent application of sound principles

(Continued on page 30)

(Continued from page 29)

to every area of management activity; and of the need for re-appraising existing policies and installations to be sure that they still work validly.

And on the other hand, we need also a forward-looking experimental attitude. All management problems have not been solved. What of the optimum size for organizations with different purposes? What of the proper relation of research upon product or process to the desirability of scrapping going machines and methods? What of the relation of the individual plant with high efficiency and low costs to an industry over-capitalized, over-equipped with plants and subject to cut-throat competition in the market?

Putting one phase of the problem more broadly—is the scientific management of a single producing unit able to be truly scientific if it tries to operate without reference to conditions in its industry as a whole?

Has the scientifically minded manager no responsibility for or no direct concern *with the operation of his industry as a scientifically managed industry?*

The idea of planning—of knowing what the aim is and of adapting means economically to the accomplishment of that aim—is a fundamental idea, accepted widely in managerial circles.

Can we stop with planning applications at the door of the factory?

Is there not the professional responsibility upon us to go back to fundamentals and at the same time to go forward to the use of those fundamentals more consistently and more daringly than ever before?

The engineering approach is one which implies the benefits of large output, of low cost, of quality product. The engineering and managerial drive is, when it is undisturbed by other factors, fundamentally a social drive.

What are the disturbing factors? Why can we not engineer and manage our economy into a use of the productive abundance we have learned how to create?

Until these questions are faced, managers have not thought about their functions in genuinely scientific, truth-seeking terms.

**A**MONG the problems of management upon which the returns are not all in, is the problem of centralization versus decentralization, of centralized authority versus local responsibility.

Even within an organization like THE SOCIETY FOR THE ADVANCEMENT OF MANAGEMENT it is not easy to steer the right course between local and central-office

activity. And the problem is not made any easier at this time when financial retrenchment does not permit us to have a full-time executive in the national office to foster and inform local activity as much as would be ideally desirable.

Yet the policy should be clear. The vitality, growth and influence of our Society are directly dependent upon the strength of local activities and student branches. They can keep the fact and the meaning of the national body before members in localities where chapters exist in a unique way that is of superlative benefit to all. Local units can and do conduct meetings which are splendidly educational because closely related to the needs of local groups.

The central office, on its side, can offer guidance, act as a clearing-house of information both for chapters and for individuals, and publicize significant ideas in the Journal, the News Bulletin and the annual conference. Up to the very limit of its resources the central office is the service agency for local chapters and individual members alike. If it does not serve intelligently, it is only because it has not appreciated what services are most valued.

There should be at least twenty chapters to make our Society's influence really felt throughout the nation. And as a training and proving ground for later membership there might well be two score student branches.

The answer to any who have misgivings about whether a national organization can be of any real aid to local groups is to organize a group (only ten members from a locality are needed as a start) and discover how anxious the central office is to be of service.

And there will then come, all the sooner, the time when we can again afford an executive director who can continuously enhance a fruitful relation between the local and the national organization.

**T**HE article-review of the four recent studies of the Brookings Institution by Professor McCracken in this issue calls attention to a significant piece of economic research. The factual findings of these four studies merit the thoughtful consideration of every executive. No one can pretend to a realistic grasp of present economic trends who fails to take account of data they present. Management science simply cannot develop to its largest usefulness unless the thinking of managers is illuminated by the results of this type of analysis. We are under special debt to Professor McCracken for his willingness to prepare this able evaluation.

# Training and Selection of Workers<sup>1</sup>

By RALPH W. LANGLEY

Industrial Engineer, St. Louis

And JOHN R. EDWARDS

Industrial Engineer, St. Louis

THE importance of training workers has not been stressed in recent years and few references to the subject have been made in the recent literature on management.

Considering economic conditions, this was to be expected. The employes remaining in industry were picked individuals and the importance of training them has not been as apparent as when new operators were being taken on to meet demands for more output.

As industrial activities increase, each employer will seek people already trained for the kind of work which he needs done. But many of his former workers will have become established in other cities and will not respond. Others will be unable or unwilling to return to their old jobs. Some will come back to find that new methods and equipment have been installed in their absence. Under these conditions it will be necessary to devote serious attention to training in order to reach the operating efficiency required to permit the employer to pay the wages which will be demanded and at the same time to keep down labor turnover.

Industry as a whole will be faced with the necessity of selecting and training a large number of people.

In the older literature on scientific management attention has been repeatedly directed to the importance of training workers.

To cite only a few of the statements as to its importance, Frederick W. Taylor wrote,<sup>2</sup> "The greatest prosperity can only exist as the result of the greatest productivity of the men and the machines of the establishment. . . . If the above reasoning is correct, it follows that the most important object of both the workmen and the management should be the training and development of each individual in the establishment, so that he can do (at his fastest pace and with the maximum of efficiency) the highest class of work for which his natural abilities fit him."

King Hathaway says,<sup>3</sup> "The acceptance of this viewpoint places upon management a definite responsibility for so selecting, training, and assisting the workers that all those assigned to a given kind of work will be "first class" operators or may properly be expected in due time to become "first class."

Gantt<sup>4</sup> devoted a chapter to it in his book, "Work, Wages and Profits." He stressed the importance of:

1. Developing the best method of doing the work.
2. Reducing the method to writing.
3. Teaching it to the workmen by means of a competent instructor. He found, among others, the following results:

- a. Many excellent operators were developed from the ranks of the unskilled.
- b. Workers were better satisfied, co-operated with the management, and had increased confidence in it.
- c. Labor turnover was decreased.
- d. Production was increased.

The purpose of this paper is to describe a systematic method of training and to show that it not only develops skill rapidly, but as an incident collects information which is of value both in the preliminary and in the final selection of workers. By preliminary selection is meant the decision as to whether the beginner is a sufficiently good prospect to be retained permanently. By final selection is meant the determination of the operator's capabilities; that is to say, the classes of work which he can be taught to do successfully in a period which is economically practicable.

In order to give an example of the results which can be obtained by systematic training, the progress of two representative groups of operators is given. One group had been operating for three years on piece work without systematic or formal training; the other group had had no previous experience.

When comparing the progress made by a group of operators without such instruction with that made by a group under systematic instruction, it has not been

<sup>1</sup> Paper presented at the annual meeting of Federated Management Societies, New York, December 6, 1935.

<sup>2</sup> "Principles of Scientific Management" by Frederick W. Taylor, page 12.

<sup>3</sup> "Methods Study" by King Hathaway, *Bulletin of the Taylor Society*, October, 1930, page 220.

<sup>4</sup> "Work, Wages and Profits" by H. L. Gantt, chapter on training the worker in habits of industry.



possible to eliminate entirely all other variables, such as service to the operator by inspectors and other auxiliaries. But these variables were kept as nearly constant as possible and may be considered as constant in view of the long training periods.

It should be noted in this connection that systematic training can be carried on effectively only after the methods have been standardized and reduced to writing and the tasks set on the basis of elementary time studies.

In addition, it is necessary to standardize working conditions and equipment, to provide a system of production control, to route suitable work to new operators, and to organize the various auxiliary functions, such as inspection, to provide uniform requirements as to quality, and the order of work function to provide prompt service.

Without these arrangements, it is almost impossible, with any variety of work, to exclude such variables as delays, variations in method and equipment, and variable standards of inspection,—all of which confuse the new operator, multiply the methods to be learned, and make it difficult or impossible for the new operator to make rapid progress.

While it is not the purpose of this paper to go into detail in describing the installation of scientific management, it is thought worthwhile to emphasize the fact that it is not possible to derive the full benefits which result from training the operator without following through with all of the four principles of scientific management; namely, to develop a science for doing the work, to select and train the operators, to develop co-operation between workers and management and to bring about acceptance by the management of its share of responsibility for such things as providing and maintaining tools and equipment, and providing materials and supplies of the right quality.

It may be possible in some instances to select the individuals best fitted for the work to be done by giving the applicants psychological tests, or by making the selection on the basis of past experience in similar kinds of work. While both of these methods may be of value, the final test of proper selection will be the performance of the individual on the job. Whether this performance will be satisfactory will depend as much on the quality of the instruction given the worker during the first few weeks of employment as upon a wise selection of the individual. No attempt was made to select applicants by means of tests. Applicants who passed a thorough physical examination and who had no apparent physical handicaps, and who obviously were

sufficiently intelligent, were taken on as occasion required.

It has been our experience that it is necessary to give careful and thorough individual instruction to the new operator during the first two weeks especially in order to prevent his becoming discouraged and indifferent.

The results obtained by training will also depend on the wise selection and careful training of the functional foreman designated as the instructor, and on individual instruction so directed as to strengthen weak points. The following method of selecting an instructor usually works well.

From among the best operators select the one who combines the most energy, intelligence and patience with the best disposition and personality. Have this operator do the work from which the methods and the original elementary time-study data are derived. This gives the methods man opportunity to check his original estimate of this operator's qualities. If his original good opinion is verified, make this operator the first instructor at a rate of pay high enough to be distinctly attractive.

If it is possible to do so, we prefer to take on only two new operators every two weeks for each instructor. If it is necessary to take on operators more rapidly, we have at least one instructor for every six new operators. In making the methods and time studies each complete operation or job is broken down into several component or sub-operations consisting of cycles of elementary operations. The instructor first teaches each member of the group the correct method of performing each sub-operation on each job and then concentrates his efforts on two operators at a time to bring their output up to the task requirement on one simple sub-operation. The purpose of this procedure is to determine in the first two weeks whether there is any operator in the group who cannot learn to do the simplest sub-operation in the task time. If so, he is given special attention for one more week before it is decided whether he shall be transferred to other work or dropped. In almost every case this additional week of training serves to bring the slower operator up to the requirement on at least one sub-operation.

A record is kept of each operator's progress on each sub-operation, and as fast as the task requirement is met on one, another is selected and the operator brought up to task time on it. Meanwhile no effort is made to get increased speed on the more difficult sub-operations. As these are encountered later, they usually offer little difficulty. They have been performed repeatedly in the

correct manner during the training period, and it is only necessary to give the operator some individual instruction in order to enable him to do each in the task time.

In connection with the more difficult operations an interesting conclusion was reached. The standard methods originally selected, and based on the work of an operator already trained, were not as quickly learned in some instances by new operators as other slightly different methods equally rapid, which were later developed because most of the new operators encountered difficulty in doing these particular operations in the task time. As the work was done entirely by hand and no machine equipment was involved it was not difficult to modify the methods.

This plan of training reveals not only the operator's deficiencies, but also his special aptitudes as they exist or as they are developed. It not only confirms or rejects the first selection of the operator for the work as a whole, but carries on the selection for specific kinds of work as a part of the training program.

For example, in the work to be described later there was a small group of highly skilled operators constantly engaged in weighing small quantities of costly goods very accurately and a larger group engaged in weighing cheaper goods on much less sensitive scales, less accurately. A knowledge of the rapidity with which skill was developed by new operators in the weighing operation during their training period was most useful in choosing individuals to be added to the smaller group as required.

A definite schedule of progress to be made week by week by new operators during the training period was laid out and the progress of each was checked against it every week. The progress schedule is expressed in terms of the ratio of the task or standard time to the time actually taken for all jobs finished during the week. This ratio is the same as the percentage of task accomplished, and is referred to as the operator's efficiency. Bonus is paid however only on jobs accomplished in the task time.

The jobs assigned to operators in training are confined to the simplest classes, selected because they involve the smallest variety of the least difficult operations. It sometimes happens that more difficult jobs are assigned either through error or because of production demands. Such jobs are excluded from the calculation of the efficiency of the operator in training. The proper selection of jobs for the new operator has an important bearing on his progress.

If the new operator's efficiency for any week fails to

improve according to schedule, the jobs worked are reviewed. The instructor keeps a record of the time taken by each operator in his group of operators in training to do each of the principal sub-operations.

From this record the sub-operation which requires attention is recognized and the methods man determines by means of an elementary time study of the operator's work on this operation in what group of elements the difficulty lies. The instructor then gives special attention to this particular cycle or group of elements. This method of reviewing and checking the new operator's work directs the instructor's efforts to those parts of it which most need attention. It also shows which of the new operators have special aptitudes, and what these are, and permits the selection of operators as they are needed for more difficult and more highly paid kinds of work. Usually in a group of six there will be at least one whose performance on all operations is exceptionally good, and always one or more who show exceptional ability on some operations.

As previously stated, the work was done almost entirely by hand, and consisted of jobs made up of several small component operations. Although there was a great variety of materials they could be classified as to those characteristics which determined the method to be used in handling. For each class of materials the utensils and methods were studied and standardized and elementary time studies made of groups of basic elements.

Instruction cards were written and tasks were set using the Gantt task and bonus plan of wage incentive. A system of planning and control of the work was put into effect, the auxiliary functions organized and the personnel of such functions trained in order to avoid delays in providing work for the operators. While this was being done, method and time study work was continued and an instructor selected. The system in use when this work was started was piece work based on less exact time studies and on conditions as found, with a guaranteed minimum hourly rate but with no written instruction cards or standard elementary data. Over a period of years, changes in the work had occurred without corresponding changes in rates, so that the operators earned higher wages on some jobs than on others.

From the records of piece work earnings, it appeared that 30 per cent of the operators earned high wages consistently, 30 per cent earned medium and 40 per cent low wages. Taking the first group's earnings as one hundred, the earnings of the second group was eighty



and the third group seventy. Some individual's earnings were as low as fifty in the third group.

The first operators changed over from piece work to task and bonus were those whose earnings had been the highest. These were taken on one at a time by the instructor and taught the standard methods. Each job was supervised by the instructor until the operator earned bonus on it. Then another operator of this class was taken on and the process repeated.

No difficulty was encountered in bringing the first class of operators up to the task time, but when the second class was reached, it was found that the efficiency of the group as a whole was only seventy per cent. The chief difficulty lay in the fact that no clearly defined standards of quality existed, and what was acceptable today might not be so tomorrow. As a consequence, these operators fussed with the work instead of finishing it and putting it aside. It took longer to overcome this habit than to teach the operators to do the work in the time allowed once the habit was overcome. The members of this group had been doing the work for three years on piece work and had learned the correct method for most of the operations. The instructor took this group on at the rate of two a week and brought the group up to 90 per cent efficiency in two months from the time the first operator in the group started. We would have continued with this group but at this point it became necessary to increase the operating force to meet increased demands for production. The third group was not available for training because it had been transferred to other work.

An entirely new group of operators was taken on at the rate of two a week. The easiest jobs to learn were assigned as far as we knew them from our experience in training the second group. The instructor taught the proper method for each operation without regard to the time taken until the operator performed each properly without hesitating over it. Then the easiest operation was selected and the operator was brought up to task time on it. As difficulty was encountered on an operation, the cycle or group of elements in it which was responsible was located by elementary time study and further training applied to that group of elements.

At the end of fourteen weeks this group of new operators which started at 37 per cent efficiency had been brought up to 70 per cent. This was the point reached after three years by a comparable group without systematic instruction on piece work. Comparing the further progress of these two groups beyond 70 per cent efficiency, it took the group of new operators six

weeks and the group of old operators of the second class two months to reach 90 per cent. The difference was due in part to one exceptional operator in the new group and in part to better understanding on our part of the training problem.

When the new group reached ninety, it was again necessary to divert attention to operators of lower efficiency because the original third group, whose transfer to other work made it necessary to take on new operators, was transferred back. This third group's earnings on piece work had been 70 per cent of that of the best paid group on piece work. The efficiency of this third group as a whole, when started on task and bonus, was 40 per cent, or about that of a group of new operators. The methods used and the time required to bring this group up to 90 per cent efficiency were about the same as in the case of the group of new operators.

After this group had been trained we had an opportunity to go back to the group of new operators who had been left when they had reached 90 per cent efficiency. One or two had been falling to eighty at times, and it was found that they had fallen back into poor methods and had become discouraged. The instructor found the operations upon which they were losing time and the methods man found the cycle of elements in the operation. The instructor then drilled the operators in these cycles as they were encountered on various jobs and brought the operators up to task time on them.

The objective now is to bring all operators up to 100 per cent efficiency and to have *all* bonus jobs earned. Operators at, or below, ninety are taken on six at a time by the instructor and taught how to know from the instruction card at what time each stage of the job should be completed. They are encouraged individually and taught to complete each stage of the job on time and to earn each bonus job.

They are trained to turn back to the bulletin board promptly any job when there is a delay in starting due to faulty preparation and to insist on an investigation of any job where defective materials or supplies are encountered or even suspected.

Each third-class operator whose efficiency stays at or above ninety for four consecutive weeks and who earns 70 per cent or more of all bonus jobs for two more weeks, receives an increase in base rate of 10 per cent as a qualified second-class operator. This has been of assistance not only as an encouragement to the operators but as a guide in assigning the slightly more difficult jobs to the second class rather than to the third class or beginners.

At times it became necessary due to lack of work in one department and increased production demands in another, to transfer operators from the work for which they were originally trained, to work of a different kind, and after a time to bring them back again. It was noticed that after an absence of a month or more a new operator who had reached 90 per cent efficiency, would come back and start in at 80 per cent or even lower, while an operator of two years or more experience could leave with 100 per cent rating and come back and start at the same high efficiency after a month spent on other work.

For this reason it was made a part of the training program to keep the new operators on one general class of work steadily and when interruptions were unavoidable to keep them within two weeks duration, or less if possible, by rotating the transfers among the more experienced operators.

Individual attention to the new operator by the instructor proved to be indispensable to the operator's progress. At one time, new operators had to be taken on so rapidly that one instructor had twelve operators of one to four weeks experience. This group remained at 50 per cent efficiency for a month until an additional instructor was assigned. Each instructor then gave individual attention to two operators only, at one time, until these two had learned the methods and had reached 70 per cent efficiency, then after all had been brought up to seventy each instructor took a group of six operators and brought them up to ninety.

It may be suggested that part of the progress made by the last operators trained was due to the example set and to the bonus money being earned by the older operators. While these conditions encourage the new operator and constitute a help of considerable importance they do not bring about rapid improvement without training.

This is indicated by the fact that two experienced operators who were transferred back to this work started doing 70 to 80 per cent of the task requirement and continued at this rate for two months, while all the other operators of their length of service, who had been trained systematically, were earning bonus consistently. They did not show the required improvement until given individual instruction.

If we had expected at the start to have so many operators to train, or had we fully realized the need for, and the possibilities of training, we would have trained three instructors at the outset and would have been able to make more rapid progress.

We feel that it pays to keep one or more instructors at work giving this intensive type of training as long as there are any operators who do not earn 90 per cent of all bonus jobs consistently, and at the same time to prepare for the future by using the experienced instructor to train other first-class operators. We believe that the same methods of encouragement apply to the instruction of new operators that apply to the starting of skilled operators on task and bonus.

In the latter case the methods man checks each cycle of each operation on the first few jobs, and tells the operator as each cycle is completed in task time and as each stage of the job is completed. In this way, as was pointed out by Gantt, the job does not seem to stretch endlessly ahead of the operator, but is attacked in definite sections. As the operator succeeds with each, he is encouraged by his success to attack the next section with confidence. This procedure has been proven necessary to the successful performance of tasks based on accurate time studies, until even skilled operators have become accustomed to working steadily.

In the former case the instructor begins with a new operator and takes the attitude that there is no doubt that the operator will succeed. After teaching the methods so that the operator does them without hesitation, the instructor selects an easy operation and brings the operator up to task time on it and points out progress as it is made.

In this way the new operator is not confronted with a discouraging mass of details, but has his efforts directed against one simple part at a time. He is encouraged by his success with each part to attack other parts of the work with confidence.

In setting the original tasks, the work of the most skilled operators was used only and the elementary times were selected with care. A high standard of performance was established. For this reason the usual fears were expressed that only the "good" operators would succeed and that the work of an "average" operator should have been used. This probably would have been true if a training program had not been established and persistently followed and if other essential features of a system of scientific management had been neglected. This is a common fault growing out of lack of understanding of what constitutes true scientific management.

The results indicate that there were practically no "poor" operators in the original group and our experience with new operators has discovered only a negligible minority of people who do not respond satisfactorily to well directed and systematic training. The few ex-

ceptions seem to be due more to lack of interest than to lack of ability and in many of these exceptions it was possible to arouse the necessary interest by an appeal to the pride or self-interest of the individual.

None of these training activities have aroused any resentment nor caused anyone to leave the company's employ. The personal appearance of the members of the group has improved noticeably and absence from work has almost entirely ceased. Labor turnover was low at the start of the work and is now even lower.

The combination of task and bonus with training, instead of piece work without systematic training, has increased the output per operator hour by 50 per cent, with a resulting reduction in labor costs and higher weekly earnings for the operators, as a group.

It is quite apparent after observing the group closely for more than a year that the increased output is not made at the expense of the operators' physical reserves. Almost hourly changes from one job to another provide intervals of change and relaxation. Also, within each job there are several operations which differ sufficiently to break any monotony. Formal rest periods were not used for these reasons.

What results precisely may be expected from the systematic training of operators in other classes of work are not predicted. But experience indicates that a thorough trial will give better results in more ways than most of us would dare to expect, and will more than pay for the time and attention given the problem.

### Discussion

**King Hathaway.<sup>1</sup>** In this paper Dr. Langley and his associate, Mr. Edwards, deal specifically and in a practical way with one of the four great principles which Taylor referred to as the essence of scientific management. To many people, principles are but phrases expressing noble sentiments related but vaguely to practice.

The wide and thinly spread applications, or perhaps I should say misapplications of uncorrelated features of scientific management throughout American industry, have been made with little cognizance or complete ignorance of its fundamental principles or of the mechanisms or technique evolved by Taylor and his associates for the practical application of the principles.

In my own work as a consultant and manager, I have found the principles just as essential to guiding and checking my course as the mariner finds the sun, moon

and stars in navigation. In the application of Taylor's philosophy one may only proceed with assurance of success provided that his practice is in accord with and gives expression to principles. However, it must be borne in mind that no one of the four principles may be applied alone with complete or adequate success, nor can the ultimate benefit be hoped for from the utilization of isolated elements of scientific management mechanism or technique. A little reflection will indicate that in either event they are inter-dependent. It is a tragic commentary on the limited vision of American management that this should not be more generally realized.

Although the paper deals ostensibly with a single principle and a technique for its practice, the authors have indicated its dependence upon all others—principles, technique and mechanisms. One point brought out by this paper which cannot be too heavily emphasized is that under scientific management the vast difference in efficiency between operators which is found under ordinary management disappears almost completely. Under ordinary management, taking the performance of the best as 100, others will show performances ranging down the scale to 40 or less. Experience in numerous plants and in work from the simplest to the most complicated has proven that virtually all may become first class and that the performance of the best may be considerably improved. This is due to a number of things which may be summed up in improved standard of conditions and methods—training, encouragement and service to the operator.

Another point to be emphasized is that several of the best operators should be so trained that they may be called upon in case of need to serve as instructors, returning to their jobs as operators when the need has passed. Such flexibility is, of course, desirable in the case of all supervisory functions and is commonly provided for and utilized under scientific management. At all times except in the case of a very small stable force there is need permanently for one instructor or shop methods supervisor—to straighten out difficulties, to encourage and help the less self-reliant, to teach operators promoted to higher grades of work, to explain newly developed methods in connection with either new or old jobs, etc.

I am personally deeply grateful to Dr. Langley and Mr. Edwards for having presented this paper. I, with others, have long felt that our Society has fallen short in the matter of directing interest to the practical aspects

<sup>1</sup> Consulting Engineer, St. Louis, Mo.

(Continued on page 59)



# The Future Relations of Government to Business<sup>1</sup>

## Some Controlling Factors

By H. S. PERSON

Consultant in Business Economics and Management, New York

ALTHOUGH in response to a prayer for something warming during the first cold spell of the season some ten days ago, readers of the metropolitan newspapers were greeted by conspicuous front-page captions somewhat as follows: "Three fronts hail business upturn, sustained a year; Reserve Board points to rise in industry, income, profits as assuring continuance; labor sees two booms, acclaims industrial advance, but warns of stock market expansion and collapse; building now in demand, wide construction activity is linked to recovery trend by housing administration."<sup>2</sup> The business community was cheered by this news, and most of them probably felt assured that now we are positively on the up-grade, happy days will soon be here again, especially the happy days of laissez-faire and freedom from government interference with business.

Certainly there are grounds for gratifying expectations. We appear to be decisively on the up-grade; agricultural relief, public works and other government spending have at last turned the trick. Although the various indices are not in agreement with respect to detailed figures, in general they tell the same story: since 1933 a 45 per cent rise in factory production; a 30 to 40 per cent rise in general business activity; a 40 per cent rise in gross farm income; a 21 per cent rise in wholesale prices and an 11 per cent rise in the general price level; and an increase in national income of approximately 20 per cent. There are encouraging figures, and especially encouraging is the fact that the advance has been fairly well sustained throughout the current year.

Yet, if one were responsible for a business that does not find its opportunities in uncertainty—that requires conservation of heavy investments or of a good-will acquired through years of painstaking struggle, and therefore requires the long look ahead—one should not feel complacent. Perceiving certain factors not revealed by statistical data—factors that might well be controlling and compel continuing adjustments and readjustments—one's concern would continue to be great. It is quite possible that these controlling factors may manifest their full effects only after we have acquired more

speed and momentum; and that they will compel continuing experiments in the development of dynamic relations between government and industry, incidentally including experiments by every business enterprise in constant adjustment to this development of new relations between government and industry.

Outstanding among these factors—the one to which most if not all the rest are collateral—is the fact that we are beginning to weave a new pattern of relations to the business cycle; primarily a new pattern of emergence from depressions, and secondarily the outline of a new pattern of conduct to keep us out of depressions. That is a step in evolution already so far along that apparently there can be no retracing of steps.

The day that President Hoover approved the act creating the Reconstruction Finance Corporation—January 22, 1932—the first committing step in this evolution was taken. The title of that act is "An act to provide emergency financing facilities for financial institutions, to aid in financing agriculture, commerce, and industry, and for other purposes." Subsequent Federal activity affecting the relations of government and industry has been a sequel to that step, logical in principle although experimental in detail. One can say that the New Deal was implicit in the Reconstruction Finance Corporation.

The accustomed pattern of getting out of a depression is to permit widespread bankruptcies which transfer properties relieved of their encumbrances from one group of owners to another. As soon as the temperaments of the new owners have reached a certain degree of enthusiasm and confidence, they become active, starting with the advantage of freedom from debt. Their activity stimulates activity on the part of others; new investment begins, consumers spend, transactions multiply and the volume and the velocity of circulation of credit and other money increase, prices rise, the lambs begin to flock behind the wethers, and "prosperity" reappears. Observe that the critical factor in this accustomed mode of recovery is widespread bankruptcy.

President Hoover realized in January, 1932, that this automatic method of emergence from depression could not be permitted to pursue its natural course. This

<sup>1</sup> Paper presented at the annual meeting of Federated Management Societies, New York, December 5, 1935.

<sup>2</sup> *The New York Times*, November 25, 1935.

time it would affect not only ordinary business concerns; it would affect even the largest financial institutions. If they were compelled to sell their holdings in mass, values would crash on all sides, bankruptcies would spread like fire in a powder magazine beyond the needs of readjustment, the whole financial and business structure would collapse, and beyond that one could not foresee the devastation—political revolution not impossible. Therefore the President signed a bill to bring Federal funds to the aid of financial and commercial institutions, to industry and to agriculture. Although sympathetic to big business he in this act took a step carrying implications contrary to his fundamental philosophy, which indicates how dire and urgent was the situation. He could not do otherwise. But the moment he acted he cast away the old pattern of the business cycle, and began to weave a new pattern, the complete design of which had not yet been conceived. The motif was indicated, however; recovery from depression through general stimulation of distressed business by application of Federal funds instead of by bankruptcies and widespread transferal of ownerships. Later given this motif, with no choice in the matter, the New Deal has been a series of forced experiments in designing the details of the new pattern.

We are therefore climbing the grade toward renewed business activity with a new structure of relationships between government and business. This has become necessary because we did not know how to solve many of the constituent problems that would have been solved automatically although painfully under the old pattern. We have not yet learned how to solve them. There lie ahead experiment and success alternating with experiment and failure, until we have worked out the new details. Any attempt now to turn back to the old pattern would give a violent and perhaps fatal shock not only to the structure of our economy but very likely also to that of our representative democracy.

Outstanding among these constituent problems is the matter of debts. Instead of climbing out of this depression relieved of the burden of debts, we are carrying a heavier load. This means a great deal to every business enterprise, whether its own burden of debt is heavy or not; it is almost worse to have one's consumers heavy with debt than to be heavy on that account oneself. One need not be much concerned about the Federal debt, although much is being made of that by certain groups whose disproportionate share of the national income makes them the primary source of its liquidation. That debt will be paid by income taxes and only

those realizing income will have to pay it. In fact, these debts will be paid chiefly by those to whom they are paid. Payment will not create new debts. But every business man may well be concerned about the great mass of business debts, and of local government debts. Payment of business debts, interest and principal, restricts spending that constitutes purchasing power. So also does liquidation of local government debts by real estate and sales taxes. What business needs desperately is not production facilities, but sales for present production capacity; sales come from consumer spending power; real estate and sales taxes cut consumer spending power.

But, one may assert, those to whom these debts are paid can at once invest them in new plants and equipments, thereby employing labor for materials and construction. These disbursements fanning out into a thousand industries would create consumer purchasing power. This assertion brings our attention to a second collateral problem.

Statements are going the rounds that our national plant needs modernization to the extent of 25, 50, 75, 100 billion dollars. Any one of these estimates may be true, measured by the objective impersonal standards of the blueprints in the files of engineering departments. But there are other more controlling standards not so objective and impersonal. In view of our known excess productive capacity, why build more plants just to replace those that are 80 or 90 per cent efficient by new ones that are 100 per cent efficient, and that will themselves soon be only 80 or 90 per cent efficient as measured by impersonal blueprint standards? Why replace a plant 80 per cent efficient by a new plant 100 per cent efficient compelled to carry the combined debt of the two? It doesn't add up right. Large-scale new construction and modernization of an overcapacitated national plant, without a background of liquidation of pre-existing debt, would soon plunge us beneath an avalanche of new bankruptcies, and would, according to the new motif established by President Hoover, require half a dozen additional R. F. C.'s.

We need new plant and equipment to take care of growth, but just now we are not growing; the old suit hangs loose on us, is capable of substantial service, and it is not paid for. In view of the fact that we do not need extensive new plant, and that extra competition in an overcapacitated country is dangerous, and may be deadly by leading to "chiseling" on the one hand or to controlled restriction of production on the other hand; and in view of the fact that what we need is not invest-



ment but spending, selling and processing; the sustaining stimulus as we climb onto the plateau of widespread business activity is not likely to be large activity in the construction of new plant; or, if it irrationally is that, the after effect—and not long after—is almost certain to be 1929 to 1935 over again and worse.

There are many who assume that modernization of housing will take the place of modernization of our industrial plant as the outlet for investment spending. A large proportion of our housing facilities is obsolete and fails to meet the requirements of health and decent living. There are, however, numerous difficulties in the way of extensive modernization of housing by the ordinary processes of business enterprise. The Federal administration has discovered that during the past two years. The acquisition of properties for large-scale elimination of slum districts is difficult of accomplishment without loading an enterprise at the outset with intolerable capital charges that prevent the new housing from being used by the very classes it is intended to benefit. What is more disorganizing, however, is the effect of widespread modernization on the values attributed to the existing housing plant of the nation. Slum clearance extensive enough to offer an adequate field for investment spending is hardly possible without painful disorganizing capital losses. The gain in the activity of heavy industries would be offset by wiping out many equities represented in the portfolios of savings banks and insurance companies. It appears impossible to carry through an extensive modernization of housing without serious repercussions unless there is government planning, direction and subsidy in accordance with the doctrine of Federal responsibility for the public welfare.

But, another may say, there is foreign trade; foreign trade for our capital-goods and our consumer-goods industries. What foreign trade? One can sell only if one buys—accepts goods in exchange—for what nation has the funds to pay in cash, or credit for a one-sided exchange? What is the probability on political grounds that a nation overequipped with diversified plant will let down the tariff bars on some half its items in order to win markets thereby for the other half? The probability is not promising, furthermore, that if the bars were let down, we could compete, even in our own market as well as in others, with the trade of a Japan in which labor on a bare subsistence level and modern mechanical equipment are applied under public administration and private management that are notably effective in handling these factors in what they believe is

their interest. Trade under reciprocal tariffs, even in selected items with quota limitations, is a benefit; but it is not the trade that offers opportunity for large capital investments.

It appears, therefore, that such factors as our load of private and local government debts, the limitations on large investment in additional national industrial plant and in additional national housing plant, and the disappearance of free world trade, portend continuing difficulties for business as we gradually emerge from this depression; and that those difficulties will compel more instead of less concern and activity by government in business. However, these are not the only factors. They have been discussed first because of the part they played prior to January, 1932, in emergence from earlier depressions. There are numerous other factors which challenge an increasing concern by organized government. We have time to consider only a few that are representative.

The problem of agriculture is basically as acute as it has been at any time during the past decade. The approximately 40 per cent increase in gross farm income during the past three years is the result of Federal activities influencing distribution of income among the processes from production to consumption of agricultural products. The present device for bringing agricultural prices into line with industrial and commercial prices cannot be continued very much longer, but also it cannot be discontinued until a more natural and automatic device has been found.

It is imperative that we urban folk realize that natural resources are the very foundation of our existence, and that among these the most important are soil products that provide food, clothing and shelter. As a people we could exist if all of us were on the land and none of us in factories or offices; but we could not exist if all of us were in factories and offices and none of us on the land. Prosperity of banking, merchandising and manufacturing presupposes a solid foundation of prosperity in the outlying areas where the materials for food, clothing, shelter and industrial processing are produced. It is more important that the people who produce these materials, than that the people who own them, should be paid well. The greater part of the income of urban centers comes from their efforts. The ultimate, regularizing purchasing power is that of the sector of our population who work with Nature and bring to us her free gifts. The agricultural problem—the problem of bringing agriculture, industry and com-

merce into a price and income balance—must be solved. That will require continuing government effort.

I have mentioned price and income balance as a phase of the agricultural problem. It is a phase of a larger problem—that of balance among many economic groups. We assume in our thinking that we have had a competitive society, that the forces of free competition are failing to exert their full influence only temporarily, and that as we emerge from the depression they will again find free play. The fact is that we have not for some time had a freely competitive society, and that with an unregulated return to activity it is likely to be less competitive. The principal characteristic of the misguided efforts of business to run away with the National Recovery Administration and to establish their concept of industrial self-government was the effort to restrict competition much further in a grand way under legal sanction. Price fixing and restriction of production are symptoms of the decadence of a laissez-faire society.

There has recently been made a study of this matter which is highly informing, by Gardiner C. Means of Columbia University on behalf of the Department of Agriculture.<sup>3</sup> Following are pertinent facts concerning ten production groups involving a few of the 747 items studied by Dr. Means: the 747 items fall into two groups, one represented by the top of this selective table, the other by the bottom, a relatively small number being represented by the center:

*Per cent Drop Between 1929 and 1933  
In Prices In Production*

Agricultural implements . . . . .	6	80
Motor vehicles . . . . .	16	80
Cement . . . . .	18	65
Iron and steel . . . . .	20	83
Auto tires . . . . .	33	70
Textile products . . . . .	45	30
Food products . . . . .	49	14
Leather . . . . .	50	20
Petroleum . . . . .	56	20
Agricultural commodities . . . . .	63	6

These data indicate unmistakably that we have not the price structure of a freely competitive economy; that our economy is controlled, not by public government but by private governments. In a freely competitive society prices should generally be so flexible as to clear the goods which can be produced, and change in the quantity produced should be gradual. But these data show

clearly that at one extreme, with diminution of demand for agricultural implements prices are reduced only 6 per cent while production is reduced 80 per cent; and that at the other extreme, with diminution of demand for agricultural products prices are reduced 63 per cent and production only 6 per cent. The textile industry lies about half way between these extremes: prices drop 45 per cent while production drops 30 per cent. It should be noted that decrease in production means decrease in employment.

These relative rigidities and flexibilities in a price structure have a profoundly unfavorable influence on the distribution of income, employment, purchasing power, debt payments, solvency, and concentration of ownership, and are fatal to a capitalistic society. They are so important in our economy that they compel a continuing government activity toward planning, regulation and in some instances control. There is no escaping that compulsion. There is high probability that by functional necessity the people through their government will be compelled to take over and operate at cost those industries manifesting extreme rigidity of price and flexibility of employment, regulate effectively the group somewhat less rigid in price and flexible in employment, and leave to free enterprise the only area in which free enterprise can function, the area where price flexibility is automatic and employment is relatively stable.

The data we have just considered bring to our attention the problem of unemployment. All things considered, it is undoubtedly the most important of our problems. There still appear to be unemployed some 10,000,000 people capable of working—representing, let us assume, 30,000,000 citizens. Perhaps 2,000,000 of these have come of age since 1930 and have been subjected in their most impressionable years to the degrading influence of inability to be self-sustaining. The problem is appalling. There is no excuse whatsoever in a country of as rich resources as ours for such disastrous unemployment. I do not believe there is excuse even for assuming that relatively there must be any considerable number unemployable because of physical and mental defects. The assumption of the necessity of unemployment in the United States is the assumption of people who have lost their minds as well as their hearts. Shorter hours, yes; leisure, yes; but not in the form of unemployment. It appears to be technically practicable to have shorter hours and other forms of leisure, together with more physical goods and services equitably distributed. These things mean organized

<sup>3</sup> "Industrial Prices and Their Relative Flexibility," Senate Document No. 13, 74th Congress, 1st Session.

collective activity for their achievement, and that means government activity. Organized labor may be able, as in the past, to force small increments of increase of wages and leisure through shorter hours for a limited sector of the working population; but a situation wherein more physical goods, more social and private services, and more leisure through shorter hours may be widely enjoyed, can be developed only by collective action through the instrumentality of government.

One of the most potent institutions which appears certain to be more highly developed for regularization of the economic system and avoidance of cyclic depressions is represented by old-age pensions, subsidized extension of education of the young, accident and illness insurance, and compensation for unemployment—a co-ordinated group of measures for economic security. At the present moment we are only playing with these matters—doing the best we now are able, perhaps—getting ourselves accustomed to them—but nevertheless only playing with them. For their co-ordination as a group, for avoidance of the dangers in them, and for their use as an instrument of positive regularization, only a central government is competent. Considering only the economic influence of vast blocks of reserves for periodic investment and liquidation, there is downright danger in not having this institution under strong central control and directed by a wise unifying policy. That control is especially important for the positive uses which may be made of reserves: their possible influence on the ratio between investment and saving; on the volume of credit and money; on deflation and inflation; on employment; on the distribution of income so as to sustain widely distributed purchasing power. A system of old-age pensions, subsidized education and unemployment reserves would be not merely an institution for relief of destitution, but more important, for the regularization and maintenance of business itself, with relief of destitution becoming secondary. But the elements must be co-ordinated and uniform as to policy and procedure, and especially as to the handling of reserves.

One might discuss many other factors—technology, taxation, our position as a creditor nation, war, the population trend, cultural services, balancing the budget, and so on, all of which point in the direction of intensified government relations with business; but it appears that a sufficient number of factors have been discussed to afford an answer to the implied question in our controlling subject of discussion this evening. These future relations are bound to involve more co-

operation between government and business with government as the controlling co-operator. I do not like the term co-operation as it has just been used, because generally it is understood to mean the relations of equals; and in the particular instance that a sector of our society, business, has power and authority equal to that of the total society. Government is the only instrument through which the whole society expresses itself. If we were—what is impossible of doing—to set up another agency in place of government for expression of the whole social body in matters economic, that new body would still be nothing other than government.

And it would have to be government representing the entire social body; not a group of lesser governments futilely attempting to solve the problems of the whole. This is in accordance with the principle I sometimes called the principle of functional necessity. A problem can be solved only by an intelligence and authority coincident with the entire area of the problem. One does not have to develop that thought when speaking to an audience of business executives and engineers; they know that the fundamental characteristic of the development of management in private industry during the past quarter century has been establishment of planes of planning and execution that correspond to the areas of the various problems. Auxiliary planning and execution can be decentralized, but decentralized effectively only when subordinate to a controlling planning and execution that cover the area of the problem. It is on that basis that there has been developed interrelated planning and execution simultaneously on the plane of ownership and entrepreneurial control, on the plane of general management, on the plane of major departments, and on the plane of constituent units, each in this series being but a more detailed expression of the policies and programs of that on the plane above it. This development has been because of functional necessity; the modern typical business enterprise could not have been developed otherwise. There must likewise be established planes of planning, control and execution in the domain of social affairs—and for the same reason, functional necessity. Our social-economic organization and the processes are too complicated for any other solution. That necessity is the outcome of our ingenuity in division of labor, specialization, indirect production, and organization. The steps we have taken cannot be retraced. Decentralization and the small enterprise, as we have known them in the past, are a

(Continued on page 59)



# The Development of a Standard of Measurement for the Performance of a Package Delivery Truck<sup>1</sup>

By E. WILLIS WHITED

Consulting Engineer, Research Bureau for Retail Training, University of Pittsburgh

THAT delivery is an important item in the total operating cost of his store is not news to the department-store executive. He knows that this function of his business absorbs from 1 to 5 per cent of the retail selling price of the merchandise, depending on the bulk of the merchandise and the kind of delivery he must make. But delivery is one of the services most stores offer to their customers. When the customer says "send it," even though it is a spool of thread, to be delivered to an address some ten miles from the city, that request must be granted. Since delivery has come to be one of the services a customer expects, the store can do nothing more than try to perform this service as economically as possible. And it is toward this end that store executives are working.

Two difficulties confront the executive when he attacks this problem. The work of a delivery truck varies constantly from day to day, not only in amount but also in the kinds of service rendered. The other difficulty arises from the fact that about two-thirds of the cost of delivery is incurred while the truck is out on the street, operating under the sole control of the driver with no direct supervision. In fact, the only parts of the whole operation that can be performed under immediate supervision are the preparation of the merchandise for delivery, the loading of the trucks, and the maintenance of the fleet. But these three elements account for only one-third of the total cost.

Because direct supervision of the truck on its route is impossible, many delivery superintendents have been trying to develop wage incentive plans which will be equitable, effective, and, at the same time, reasonably simple to operate. The fundamental problem that must be solved is the determination of what should constitute a day's work for a truck. Most delivery superintendents have grown up from horse and buggy days, and have learned the business in the stern but effective school of hard knocks. Many of them have become quite expert in determining how long it should take to deliver a given load, but these opinions are based on long experience rather than on an analysis of the vari-

ous elements involved in the job. Although they may be reasonably accurate, they are not a very satisfactory base for a wage incentive plan.

The determination of what constitutes a day's work for a truck presupposes that this day's work can be measured quantitatively. In other words, it is essential that there be a standard of measurement for the performance of such a delivery truck.

Before inquiring into the methods that were used to develop a standard, it might be well to discuss briefly the usual duties of a truck driver. When the driver reports in the morning, he finds his load of packages stored in what is usually called a driver's bin. Sometimes this bin has shelves, and sometimes part of it is on wheels so that it can be rolled out to the truck, if the truck cannot be backed up to the bin. His first duty is to sort the load into small geographical divisions, an operation called rough-sorting. His next step, called fine, or stop-for-stop sorting, is to sort each division accurately, just as it will be delivered. If facilities permit, he will do this fine sorting as he loads his truck. That is, he will fine-sort the first division and place it in his truck, then he will fine-sort the next division, and so on. Some drivers will fine-sort the entire load before leaving the delivery center, whereas others, especially if they have a helper, will fine-sort the first few divisions only and load the remainder of the merchandise by divisions, fine-sorting from time to time during the day. When the truck is loaded, the driver proceeds to his route, which may be anywhere from a fraction of a mile to fifteen or even more miles from the delivery center. This part of the trip is termed "the dead run out." When he reaches his route or territory, he goes to work delivering. Now the driver is operating on delivery time and delivery mileage. Finally, when he has finished making his deliveries, he returns to the delivery center, making what is called "the dead run in."

Although a delivery man has some eighteen different delivery services to offer his customers, most of them, from the standpoint of time required for performance, fall into a very few categories. The principal class is the paid and charge delivery, which is called the straight

<sup>1</sup> Paper presented at the annual meeting of Federated Management Societies, New York, December 6, 1936.

delivery. Here, the driver has only to deliver the merchandise at the proper address, identify the addressee and the store from which he comes. It is the simplest delivery he has to make, and generally the most common. The next in importance is the C.O.D. delivery, in which he must collect for the merchandise before releasing it. It takes longer to make this kind of delivery, because he must wait until the customer gets the money with which to pay him. The third in importance is the call for merchandise to be returned to the store. In this case, the driver must wait for the customer to wrap the merchandise that is being returned. The fourth variety of delivery requires a little more explanation.

Most drivers deliver their load from the front of the truck; that is, the truck is loaded so that they can reach the package from the seat and take it off with them instead of getting off the truck, going around to the rear, opening the doors, and getting the package. Obviously, front delivery requires less time than so-called rear delivery. Some merchandise, however, such as ash cans, step ladders, rugs, or large cartons, is too bulky and awkward to lift over the front seat or take through the comparatively narrow front door. Such merchandise is termed bulk, and is always delivered from the rear.

Again, there are several kinds of homes that a driver must serve. First in importance are ordinary residences, and second are apartment houses. In addition, he must also deliver to stores, office buildings, institutions, and the like, but these deliveries make up but a small portion of his total load.

With this explanation of the general problem, the method that was used to set up a standard of measurement for the performance of a package delivery truck will be discussed.

The preliminary work on the development of this standard started two years ago when four senior engineering students investigated various methods which might be used to attack the problem. It was quickly discovered that the first step would necessarily involve extensive time studies. This was because, except for the work of Wess in 1923, little had been published concerning the relative importance of the various delivery services that a truck driver is called upon to perform from a time-consuming standpoint. After several preliminary tests a tentative schedule was developed, and these seniors went out on trucks and observed some five thousand deliveries. The form that they used is shown in Figure 1.

[illegible]

FIGURE 1

In addition to the detailed observations of each individual delivery made throughout the day, certain other data, which were used primarily for identification purposes, were recorded on another form, Figure 2. These data included the route number, with a brief description of the territory served, the weather, driving conditions, and the experience which the operating crew had, both with delivering in general and in serving this particular route.

A study of the observations of these five thousand deliveries provided a check on the amount and character of field data that would be required.

The next step was to organize a field observation

University of Pittsburgh  
Retail Research Bureau

**Package car delivery study.**

Store \_\_\_\_\_ Day of week \_\_\_\_\_  
Observer \_\_\_\_\_ No. \_\_\_\_\_ Date \_\_\_\_\_  
Observer \_\_\_\_\_ No. \_\_\_\_\_ Watch No. \_\_\_\_\_  
Make of truck \_\_\_\_\_ Age of truck \_\_\_\_\_ years. Route No. \_\_\_\_\_ Helper \_\_\_\_\_  
District served by truck \_\_\_\_\_  
  
\_\_\_\_\_  
\_\_\_\_\_  
Driver, years of experience delivering \_\_\_\_\_ Experience on route \_\_\_\_\_ months \_\_\_\_\_ years  
Helper, years of experience delivering \_\_\_\_\_ Experience on route \_\_\_\_\_ months \_\_\_\_\_ years  
Condition of road \_\_\_\_\_ weather \_\_\_\_\_  
Remarks \_\_\_\_\_  
  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

FIGURE 2





mitted the determination of the time spent loading, the length of and the time consumed in traveling the dead run out, the dead run in, and the delivery route itself and the time spent checking in at night.

When this sheet had been completed by the driver, it was turned in to the office, where a clerk entered the number of different kinds of deliveries that the truck had made by classes and, in addition, recorded the number of stops that had been required to make the various classes of deliveries. This last information was obtained by counting the number of different addresses to which the packages had been consigned as listed on the manifest.

One thing which the detailed time study in Pittsburgh had shown was that the performance of the truck depended on the number of service stops it had to make and not on the number of packages it had to deliver. That is to say, it did not require any longer to deliver two or three packages to a given address than it required to deliver one.

About a dozen stores in as many cities collected data on more than 800,000 deliveries for this study. When this material reached the office, it was turned over to a computing force, who analyzed each trip of each truck on forms similar to that shown in Figure 4. A single column of this form was devoted to a single trip of a truck, and all the trips of a given route were placed on one sheet. Having tabulated all the data, an average was struck for each element for each route and the result placed in the last column.

Passing now to a more detailed consideration of the different variables that enter into the daily activities of a truck, it is clear that a practical standard must be applicable to any route of any length and to any character of load.

Because the performance of a truck depends on the number of service stops that it has to make, it will be convenient to take as a unit of performance, the number of service stops per hour that a truck makes, instead of the number of stops per day. It will be clear that the number of stops per hour that a truck can make will increase with an increase in the number of stops per mile. That is, the determination of the number of stops per hour really includes two time elements: first, the standing time of the truck while the delivery is being made; and second, the running time of the truck to the next stop. Therefore, if the stops per mile are increased, that is, if the distance the truck has to move between stops is reduced, the number of stops per hour that the truck can make will be increased. Further-

more, by averaging the stop per hour performance of a group of routes that have the same stop frequency, a typical performance in stops per hour will be obtained for this particular class of routes.

While it is possible to secure several routes operating with the same number of stops per mile, it would be very difficult, if not impossible, to find more than a very few routes with the same character of load; that is, the same percentage of C.O.D. deliveries, of bulk deliveries,

Form 26. University of Pittsburgh  
Retail Research Bureau  
Package car delivery study.

S.R.No. \_\_\_\_\_  
Copy \_\_\_\_\_  
Add. \_\_\_\_\_  
Average \_\_\_\_\_  
Check \_\_\_\_\_

	A.M.	P.M.	All day.	Total	Average
1. Date					
2. Crew					
<b>TIME</b>					
3. Loading					
4. Waiting					
5. Dead run out					
6. Dead run in					
7. Delivering					
8. Checking in					
9. Total day					
10. T.D. less waiting					
11. Total dead run					
12. Dead run + del.					
13. D.R./D.R. + del.					
<b>MILES</b>					
14. Dead run out					
15. Dead run in					
16. Total dead run					
17. Delivering					
18. Total day					
19. D.R./Total day					
<b>PERFORMANCES</b>					
20. Total packages					
21. Straight stops					
22. C.O.D. stops					
23. W.C. stops					
24. S.A. stops					
25. Misc. stops					
26. Total stops					
27. St. stops/total					
28. C.O.D. stops/total					
29. W.C. stops/total					
30. S.A. stops/total					
31. Misc. stops/total					
32. Packages per stop					
33. Packages/del. mile					
34. Packages/total mi.					
35. Stops/del. mile					
36. Stops/total mile					
37. Loading speed in pkgs./hour					

FIGURE 4

of apartment houses served, etc. Hence, it was necessary to correct, or to make suitable allowances for these various types of deliveries before the performance of a given route could be combined with others.

Because a truck is performing only when it is out on the route delivering, the performance of a truck will be determined by the time consumed and the distance traveled between the first delivery and the last delivery.

In computing the allowances for C.O.D., call, and bulk deliveries, the amount of time to be subtracted from the truck-delivering day was determined by the detailed time studies made in Pittsburgh. It will be realized that these allowances are necessary because more

Form 32.

University of Pittsburgh  
Retail Research Bureau

F.R.R.A.

Package car delivery study

Route performance classification

Size of crew								
Three stops per mile			Four stops per mile			Five stops per mile		
Route	Stops per mile	Stops per hour	Route	Stops per mile	Stops per hour	Route	Stops per mile	Stops per hour
288	3.13	22.47	208	4.04	26.30	274	5.56	29.22
333	3.40	29.29	300	4.36	30.28	314	5.21	35.21
336	3.57	27.03	306	4.49	38.84	331	5.75	36.61
380	3.18	27.52	308	4.42	39.08	67	5.04	39.59
381	3.74	34.60	317	4.88	29.38	71	5.20	24.47
395	3.83	29.17	335	4.69	32.21	181	5.78	44.65
398	3.20	36.69	124	4.69	40.10	172	5.42	38.58
77	3.84	32.92	384	4.13	32.96	207	5.96	57.79
10	3.71	34.00	9	4.46	19.82	221	5.44	28.58
34	3.34	24.83	64	4.19	46.38	227	5.07	40.56
150	3.99	46.24	69	4.02	25.75	229	5.31	40.09
202	3.58	30.53	88	4.81	49.43	241	5.90	51.69
216	3.15	28.53	801	4.15	53.12	249	5.58	49.06
11	3.96	30.98	800	4.72	31.98	256	5.48	41.40
31	3.77	30.82	209	4.10	35.71	244	5.12	31.75
38	3.46	34.12	250	4.43	20.82	252	5.14	28.51
40	3.70	38.62	36	4.44	44.56	254	5.18	37.70
70	3.51	30.57	39	4.40	37.07	255	5.05	41.59
72	3.28	28.58	47	4.77	29.94	1	5.41	28.00
83	3.18	37.38	50	4.99	47.40	16	5.11	31.08
87	3.62	40.06	54	4.68	37.63	45	5.94	45.37
			61	4.84	41.51	12	5.90	68.51
			177	4.19	35.89	76	5.97	26.82
			157	4.20	34.20	78	5.69	40.90
Average	3.53	32.13		4.48	35.84		5.47	38.21

FIGURE 5

time is used in making these classes of deliveries. In the case of C.O.D. and call deliveries, the additional time is under the control of the customer. In the case of bulk deliveries, the additional time is under the control of the truck crew, but it is quite simple to determine, because the operations involved are few and vary but little.

The allowance required for apartment-house deliveries was determined from the Pittsburgh time studies in the same way. But because the proportion of apartment-house deliveries that a route serves is a characteristic of the route rather than of the load, the allowance was applied on the basis of a percentage of the entire load. When all the allowances have been made, the result is the time that the truck would have consumed if all of its deliveries had been straight deliveries to residences instead of part C.O.D., call and bulk deliveries.

There is still another correction to be made. The number of stops per hour that a truck can make will increase if the size of the truck crew is increased; that is, if one or more helpers are carried. No attempt has been made to calculate the proper allowance for the addition of a second or third man on a truck. Rather than attempt to determine what this correction should be, standards of measurement have been determined for each size of crew.

The field data covered about 450 different routes,

most of which were observed twelve times. These routes were classified by size of crew and by stops per mile, with stops per mile taken at one mile intervals. Figure 5 shows a typical classification sheet with performances for two-men crews on routes operating with three, four, and five stops per mile. For example, in the column headed "3 stops per mile" we find an entry for each route of the 450 which operated between three stops and 3.99 stops per mile, together with the stops per hour that each of these trucks was making. Each group was averaged to secure a typical performance.

When the average performance in stops per hour had been computed for all crew sizes and all stop frequencies, curves of average performance were plotted. Figure 6 shows these curves plotted for one, two, and three-man crews in which average stops per mile have been plotted against average stops per hour. A few comments on this chart will be in order. In the first place the points as they were plotted lie very close to these curves, seldom are they more than one-tenth of a stop per hour off the curve. This seems to show that the system of corrections and allowances for the vari-

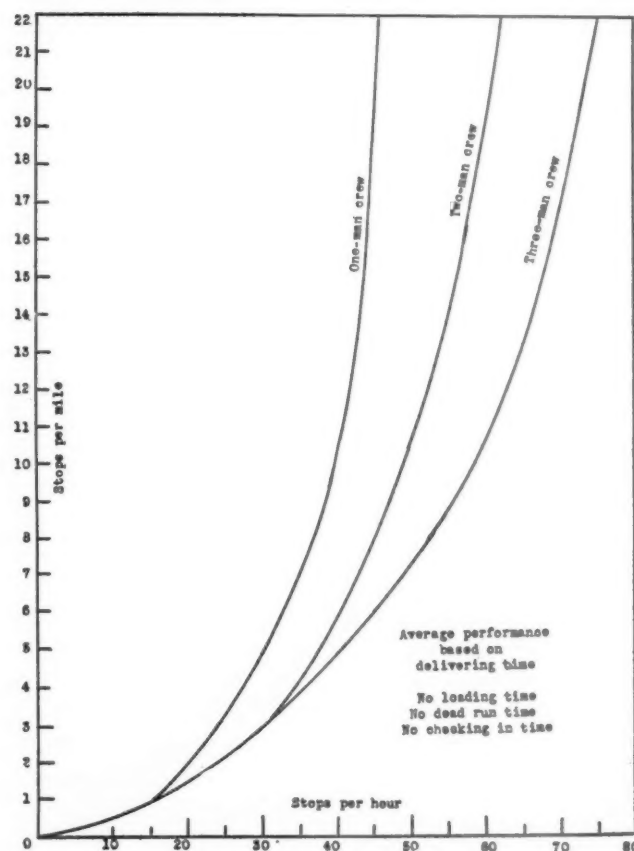


FIGURE 6



ous types of deliveries was reasonably correct in spite of the fact that the variations in performances in a given group were quite wide. In the second place the additional number of stops per hour secured when the third man is put on the truck is somewhat less than the gain secured by adding the second man. This is to be expected, because the number of times that the third man can be used to advantage is somewhat less than the number the second man can be used. The second and third men on the truck are of advantage only in thickly settled territories, and it will be noticed that their value increases as the stops per mile increase, that is, as the density of deliveries increases. Conversely, on trucks serving country districts, where the stops are widely scattered, it is hardly to be expected that additional men are of much use. That is borne out by the curves, because up to one stop per mile all three curves coincide, while the third man is of absolutely no use until three stops per mile are reached. This is well recognized from a practical operating standpoint. From an economical standpoint, of course, these extra men would not be placed aboard the trucks until a considerably greater density of stops had been attained. But below these limiting densities of one and three stops per mile respectively, the extra men are of no use whatever. Of course, these curves all pass through the origin as would be expected, and they also approach a maximum value which is reasonable. That is, one would not expect to find a two-man crew making more than sixty-five or seventy stops per hour even with a high stop frequency because the Pittsburgh time studies showed that the standing time alone for the straight delivery is almost at that rate.

The next chart, Figure 7, shows three curves. The average curve has been transferred from the preceding chart for two-man crews. The maximum curve was obtained by plotting the maximum performance in stops per hour in a particular group of routes instead of the average number of stops per hour against the stops per mile. The third curve is drawn midway between the average and the maximum curve and becomes the standard of performance. This standard curve is the same shape as the average curve and really amounts to moving the average curve somewhat further from the axis.

The rating chart for two-man crews, Figure 8, is built up by using the standard curve from the preceding chart and then adding a family of curves, whose abscissæ are different percentages of this standard. Obvi-

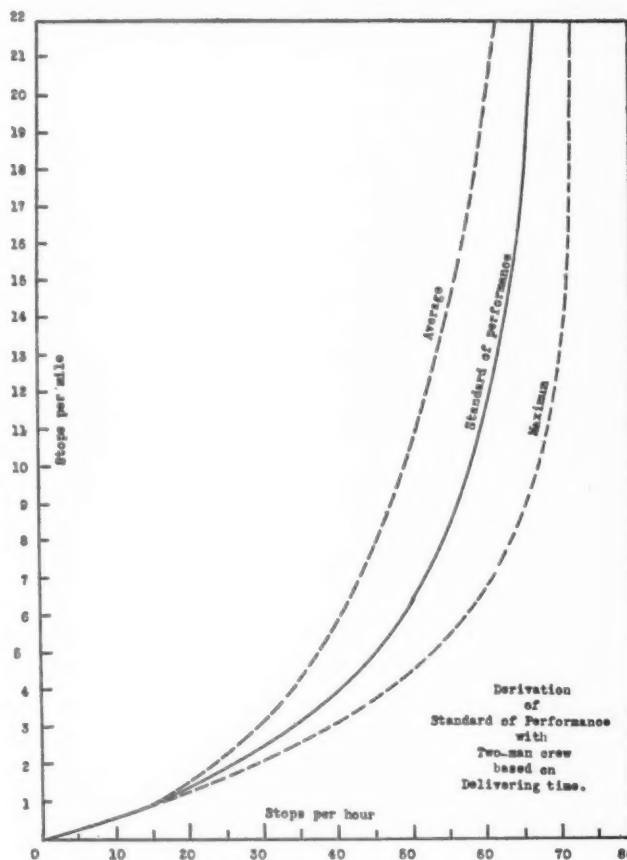


FIGURE 7

ously, rating charts for one and three-man crews would be prepared in a similar manner.

The method of using this rating chart will be apparent, and a single example will suffice. If we examine a given route which is performing at forty stops per hour and is making eight stops per mile, it will be performing at seventy per cent of the standard. It is understood, of course, that in determining the performance of forty stops per hour, all allowances or corrections have been made. With the aid of this chart now it is possible to read the performance of any route in per cent of standard, irrespective of the size of the route, the length of it, the amount of dead run, the proportion of apartment house, C.O.D., calls and bulk deliveries.

A few comments on this chart may be in order. In the first place the standard or one hundred per cent curve should not be construed to be an attainable standard either possible or desirable in a given city or in a given store. It is strictly a standard of measurement. It is well known that some cities are

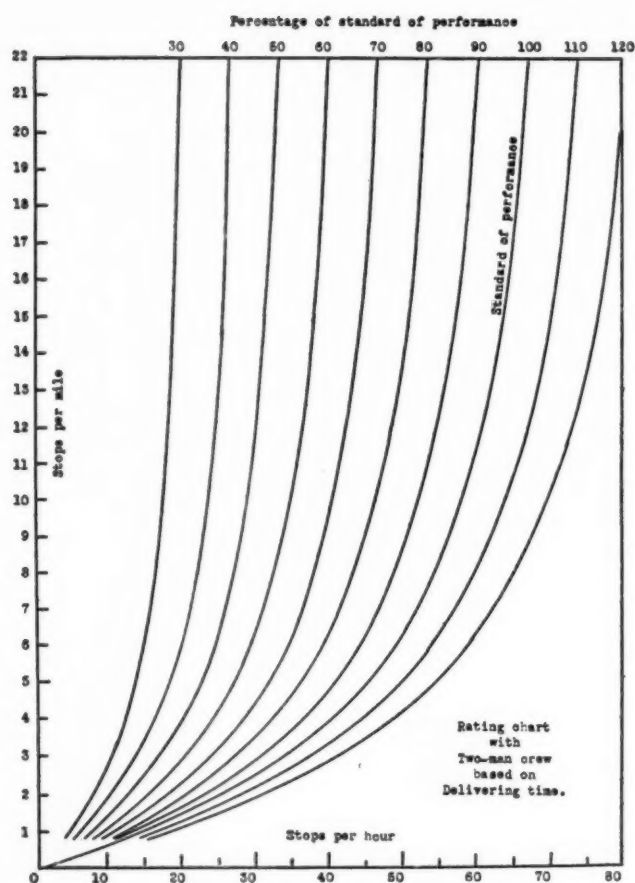


FIGURE 8

more difficult to deliver than others. Hence, an eighty per cent performance in one city would be better than an eighty-five per cent performance in another. Again some stores require, as a matter of policy, that their drivers give more than the minimum amount of attention to each delivery. For example, they might be required to carry the package indoors. This practice would reduce the number of stops per hour below that of other stores which do not require this service.

The labor of gathering the field data was quite small except for that required to count the different addresses that each truck served each day. To eliminate this labor, a system of counting service stops by means of a manually operated counter placed in the truck was devised. The counter that was used was an ordinary non-reset five-wheel instrument, which was to be operated by the driver every time he made a service stop. This change placed the entire work of collecting field data in the hands of the driver and under his control. The field data form used with the service stop meter is shown in Figure 9.

Because of the chance of mistakes in operating this counter, a few checks were introduced. The store was asked to record the total number of packages each truck carried, classified by straight deliveries, C.O.D.'s and calls. Because the latter two classifications are usually quite small, they were asked to continue counting the different addresses in these two groups. The sum of these subtracted from the total number of service stops as obtained from the total stops determined by the counter gave the total number of service stops required to make the straight deliveries. Naturally if the stops were greater than the number of packages, a mistake had been made in operating the meter, and that trip was disregarded in any future computations. A second and more powerful check was obtained by computing for each trip the ratio of packages to stops. See line 33, Figure 4. While this is always more than unity, and may be considerably higher depending on the character of the store and the territory served by the truck, the ratio for a given route from a given store will vary but little from day to day. This meant that merely by studying this ratio of packages per stop a close check was secured on the accuracy of the operation of the

Form 27

University of Pittsburgh  
Retail Research Bureau

Package car-delivery study.

1. Day \_\_\_\_\_ Date \_\_\_\_\_ Store \_\_\_\_\_ T.No. \_\_\_\_\_  
 2. Truck No. \_\_\_\_\_ Route or Unit No. \_\_\_\_\_ Number in crew \_\_\_\_\_  
 3. Weather \_\_\_\_\_ Condition of road \_\_\_\_\_

	Speedometer	Time	For office use	
			Number of deliveries	Number of stops
4. Start loading	<input checked="" type="checkbox"/>			
5. Finish loading	<input checked="" type="checkbox"/>			
6. Leave base			19. Straight deliveries	
7. First delivery			20. C.O.D. deliveries	
8. Begin lunch	<input checked="" type="checkbox"/>		21. Wagon calls	
9. Finish lunch	<input checked="" type="checkbox"/>		22. Total	
10. Last delivery			23. Character of route (please check)	
11. Return to base	<input checked="" type="checkbox"/>		Residence-suburban-country	
12. Finish checking in	<input checked="" type="checkbox"/>		Apartment deliveries _____ %	
13. Stop meter before first delivery			24. Truck loaded from (please check)	
14. Stop meter after last delivery			Front-center-rear	
15. Straight packages brought back			25. Driver-total experience _____ yrs.	
16. C.O.D. packages brought back			Experience on this route _____ yrs.	
17. Uncompleted calls brought back			26. Helper - total experience _____ yrs.	
18. No. of deliveries from rear of truck			Experience on this route _____ yrs.	

Remarks.

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

FIGURE 9



stop meter. If a particular driver set out to willfully operate the meter wrongly in an effort to show a higher performance, the chances of his over-operating at the same ratio each day were quite remote, especially since he did not know that this ratio was being computed. Incidentally, it should be stated that practically no attempts at inaccurate operation of this meter were found and the few instances were easily recognized.

The result obtained by the use of the service stop meter proved to be fully as reliable as those obtained by using field observers or by counting stops from manifests and, of course, were obtained at a fraction of the cost.

It should be noted that all of the methods used and all of the results obtained from this study apply only to average performances and not to daily performances. That is to say, there is some question as to whether or not a performance for a single day could be evaluated correctly. This standard is much more accurate if it is applied to sustained effort extending over a period of at least one week. The reason for this is that its accuracy depends fundamentally on the averages of the different variables which enter into the daily work of the truck. For example, while the time required to make a straight delivery is fifty-five seconds taken over a period of one or two weeks, the actual time required to make the individual deliveries may vary from thirty seconds

to three minutes or even more. The theory advanced here is that while it is true that the time required to make individual deliveries varies widely, the average performance is quite constant and can be measured with a considerable degree of accuracy.

In using this standard in practice it is perfectly feasible to take advantage of this same theory of average performance and set up definite factors for each particular route if it seems desirable. For example, instead of counting the number of C.O.D.'s that are delivered each day, the average number of C.O.D.'s that the truck carries can be used and set up as a constant correction. The same procedure can be followed with other variables, so that the only figure that would have to be changed from day to day would be the size of the total load measured in packages.

The actual technique of converting this standard from a stop basis to a package count basis is now being developed. When this has been completed, it is hoped that the final result will enable this standard of measurement to be used as a basis for wage incentive plans.

The purpose of this study was to attempt to provide a mechanism or a method by which the individual performance or output of a delivery truck could be measured quantitatively and without the injection of any personal opinions or estimates.

## EASTERN REGIONAL CONVENTION

Under the auspices of the Philadelphia Chapter

Philadelphia, April 23, 24 and 25, 1936

Headquarters—Hotel Sylvania

### TENTATIVE PROGRAM

#### Thursday, April 23rd

##### Shop Methods and Equipment Meeting

2:00 P. M. *Subject:* Recent Developments in Shop Methods, Equipment and Material

There will be exhibits in connection with this meeting

##### Plant Visits (2)

2:00 P. M. 1. To study office management—to some prominent Philadelphia Company

2. To study management in retail stores—to some Philadelphia department store

##### Dinner Meeting

6:30 P. M. (After dinner there will be two group meetings)

1. Production Management Meeting

*Subject:* Production and Cost Control in Factory and Office

2. Retail Store Management Section

*Subject:* Retail and Chain Store Management

#### Friday, April 24th

##### Motion Study Meeting

9:30 A. M. *Subject:* Recent Developments in Motion Study

All day session giving specific examples of developments in factory, office and selling organizations

##### Luncheon Meeting

12:30 P. M. Speakers on some current problem

2:00 P. M. Resume Motion Study Meeting

##### Dinner Meeting

6:30 P. M. *General Subject:* Trends in the Management Movement

*Chairman:* R. H. Lansburgh, Eastern Regional Vice President

*Speaker:* Ordway Tead, National President

Possibly others

#### Saturday, April 25th

9:30 A. M. A. Time Study Section

*Subject:* Problems in Installing Incentives

B. Personnel Management Meeting

##### Luncheon

12:30 P. M. National Society Meeting

Speeches by National Officers and Directors, Chapter Presidents and others on the affairs of the National Society

# An Appraisal of the Possibility of Plenty

## An Article—Review of Five Books

By H. L. McCracken

Professor of Economics, Louisiana State University

### Introduction

MOST people agree that *the* economic problem of our time is that of keeping our industrial machine operating at capacity in order that we may enjoy the degree of plenty which continuous capacity production would make possible. Men devoting their time and thought to scientific management can see nothing but unspeakable waste and unnecessary scarcity when they look about and see idle factories, idle men and abundant raw materials in the midst of poverty and dire need. One can almost hear that "wise man in Mars" as he looks down upon the peoples of the earth and says, "What fools ye mortals be! Why don't you put your idle men in the idle factories to process the raw materials and experience plenty instead of poverty?"

To this question, only two answers are possible. Either we are not intelligent enough to operate efficiently the economic mechanism we have created, or knowing how to do it, the directors of enterprise choose not to do so because they believe that there is more profit with less product; that private riches accumulate faster at fractional capacity than at full capacity. Unquestionably, we fall short of possible plenty for both reasons. If so, the measure of success which we achieve in securing plenty will depend, first, upon increased understanding and the avoidances of those errors in judgment which cause the machine to bog down, and second, upon our ability to dissolve the *apparent* conflict between maximum profits and abundance.

It was the recognition of this problem of under-capacity production and low-level consumption that induced the Brookings Institution under the direction of Harold G. Moulton, to undertake a comprehensive study of "The Distribution of Wealth and Income in its Relation to Economic Progress." The study has now been completed and appears in four volumes as follows: "America's Capacity to Produce," "America's Capacity to Consume," "The Formation of Capital" and "Income and Economic Progress."

In preparing this article on "An Appraisal of the Possibility of Plenty," the writer was asked to survey and evaluate the findings of the Brookings men, and

also the report of the National Survey of Potential Product Capacity as set forth by Harold Loeb and his associates in "The Chart of Plenty." For this reason we are presenting a sort of *review* and *critique* of their work, combined with a measure of original comment and suggestion.

I. *America's Capacity to Produce.*—The first, and foremost consideration in any study of the possibility of plenty is that of productive capacity, for it is obvious that we can never distribute and consume more than is produced. After a careful study of this question, the Brookings men told us that America can produce annually about 20 per cent more than it did produce in the super-dynamic year of 1929.<sup>1</sup>

In reaching this conclusion, Nourse and his associates have, as they say, dealt realistically with our industrial machine, taking it as they find it, with some machines new and efficient, others old and obsolescent, some plants well managed, others badly managed, farmers efficient and inefficient as we find them, and all plants, mines, etc., not good enough to be called into use in 1929, listed as sub-marginal or outside the pale of actual capacity production. By figuring capacity in this manner their estimate is far below that of the technocrats and other planning enthusiasts who have attempted to show what would be America's capacity to produce if the best known methods of production in every line were adopted generally. In referring to such a method of computing capacity, Nourse says, "While this is a fascinating field for speculation, it lies entirely outside the province of our present study. We have asked simply how much unattained productivity was latent in the actual situation of which we have more or less knowledge."<sup>2</sup>

In a review of this book prepared by the writer for *The American Economic Review*, December 1934, it was contended that the Brookings men had checked off a number of sources of additional capacity in order, as they admitted, "to simplify the problem of measurement." But the strategy of ruling out all submarginal mines and plants and idle factories, to make capacity of production *measurable* is of doubtful merit. The prob-

<sup>1</sup> Nourse and Associates, "America's Capacity to Produce," page 422.

<sup>2</sup> Nourse, *op. cit.*, page 424.

lem of computation is made more *simple*, and the figure arrived at looks more accurate, namely 19 per cent, but the actual findings are less reliable. They have since admitted the validity of the criticism, but frankly state that they "found it impossible to handle (idle and sub-marginal plants) in a completely satisfactory manner."<sup>3</sup>

Since, then, they did not attempt to compute sources of production not quantitatively measurable, it is safe to infer that America's capacity to produce is something more than 19 per cent greater than in 1929. Adding judgment to figures one might be allowed to guess that a 25 per cent increase is at least possible, which if converted into dollars would mean an increase in wealth production from ninety-two billion dollars worth of goods and services to 115 billions, purchasing power of money remaining the same. If distributed horizontally, it would make possible the distribution of an additional \$1,000 worth of goods and services to each of the 22,000,000 families, (more or less) now resident in the United States.

II. *America's Capacity to Consume.*—The maximum consumption possible by any people or nation is determined by the quantity of goods and services actually produced. *Only by increased production can there be increased consumption*, since nothing can be consumed that had not been produced. It is terribly trite and seemingly useless to set down with seriousness such an axiomatic truth. Yet, for the sake of clarity it must be said. There are so many quack notions and foolish suggestions going the rounds about the way to riches, prosperity and high-level consumption that it is necessary now and then to come down to first principles and re-state fundamentals. One might easily gain from the writings appearing in some quarters that the standard of living would rise to a higher level of consumption if labor would resort to a shorter day and week; if farmers would restrict the output of hogs, wheat, cotton and corn; and if employers would reduce the output of their factories and mines to make goods scarcer and prices higher. It must be admitted that private riches may frequently be increased by monopolistic policies and scarcity tactics, whether developed through private initiative or fostered by government. This is accomplished for certain groups because dollar income may be greater by the creation of smaller volumes sold at high prices than larger quantities sold at lower prices.

But even if such tactics could be utilized by every group of producers in a whole country, and every group showed an increase in dollar income, it would still be

true that we cannot eat, wear or be sheltered by, anything but goods which have been produced, and if fewer goods have been produced, the capacity to consume has been reduced by that amount. There is no known magic whereby a people when taken as a whole, can produce less and consume more. Therefore, the *first* limitation on the capacity to consume is the *amount actually produced*, and the *final* limitation is *capacity to produce*.

Producers, however, tell us that they would gladly produce at capacity if they could get their goods sold. Here is an inference that the consumers are the slackers and not the producers. Why do the consumers not buy more? The question is not answered in the second volume, but Moulton lets us know that he has a suspicion that it is because of a mal-distribution of income, with far too little going to the low income groups. For instance, he shows that out of over 27,000,000 families in the United States:

11,653,000	families	get	incomes	of	less	than	\$1,500
19,558,000	"	"	"	"	"	"	2,500
25,218,000	"	"	"	"	"	"	5,000

There are only slightly over two million families with incomes in excess of \$5,000 a year. They constitute 8 per cent of the population but they receive 42 per cent of the income.<sup>4</sup>

By making a study of family budgets and expenditures at the various income levels they find the types and volume of expenditures by each group. If it were possible, then, by some means or other, to increase by \$1,000 the incomes of all the 25,000,000 families receiving less than \$5,000, and if they then consumed in harmony with those now at these levels, the effective demand of consumers would be in excess of the full productive capacity of the nation. From this it follows that consumers furnish an active market for all the goods that capacity production can supply, provided they have the income.

III. *The Distribution of Income as Related to the Possibility of Plenty.*—In the third volume on "The Formation of Capital" the Brookings men break sharply with generally accepted, classical or orthodox economics. This comes about as they raise the fundamental question "What is the bearing of the distribution of income upon the demand for the products of industry." "Is the primary difficulty a lack of purchasing power among the masses?"

Having shown in the first volume that America had considerable unused productive capacity, and in the

<sup>3</sup> Moulton, H. G., "Income and Economic Progress," page 171.

<sup>4</sup> "America's Capacity to Consume," page 54.



second volume that she had great unsatisfied consumptive capacity, "it is clearly apparent that consumptive requirements and productive possibilities are not satisfactorily articulated."<sup>5</sup> These studies also revealed that an increasing proportion of the national income tended to be saved (for purposes of capital formation) rather than spent for consumption purposes. Has this increased saving accelerated or retarded the growth of capital?

1. *The Dilemma of Saving and Capital Formation.*—The dilemma of capital formation comes about in this way. "In order to accumulate money savings, we must decrease our expenditures for consumption; but in order to expand capital goods *profitably*, we must increase our expenditures for consumption."<sup>6</sup> The dilemma presents difficulties whichever way we turn. If a larger percentage of the national income is saved, we have abundance of funds with which to create new capital, but such capital is not profitable. If, on the other hand, a larger percentage is diverted into consumption channels it is profitable to construct new plant and equipment, but there are inadequate funds for the purpose."<sup>7</sup> The dilemma presents a perfect impasse with no way out unless it is possible to have a "*simultaneous increase in the flow of funds through both consumption and saving channels.*" The traditional view has been that capital expansion can take place only if there is a reduction in the rate of consumption. But, says Moulton, our "Evidence shows conclusively that consumption and capital formation do expand and contract together."<sup>8</sup> "We find no support whatever for the view that capital expansion and the extension of the roundabout process of production may be carried on for years at a time when consumption is declining. The growth of capital and the expansion of consumption are virtually concurrent phenomena."<sup>9</sup>

In summarizing the Brookings conclusions regarding the relation between consumption and capital formation or creation they are, first, that the rate of capital formation is greatest when consumption demand is highest, and is lowest when consumption is lowest. The correlation is direct and not inverse. This is possible because industry never operates at capacity. In the dynamic year of 1929, the United States was still 20 per cent below capacity production. Classical economics was tricked into one of its major errors by assuming that free competition, freedom of enterprise, the profit motive and the automatic forces would keep

production at capacity. Perhaps they would if the *assumed* conditions were the *actual* conditions. But taking us as we are, we have an unused capacity of 20 per cent at our best and 50 per cent at our worst. With this slack in the system it is not necessary to reduce or delay the creation of capital equipment if consumption expands, it is only necessary to call upon the idle labor reserve, the raw material reserves, saving reserves and bank credit to expand capital whenever consumption demand is high enough to make such behavior appear profitable.

It is merely axiomatic to observe that *if* the classical assumption of capacity production were a reality, *then* an increase in the demand for and supply of consumption goods would have to be at the expense of saving and the creation of capital goods. But Moulton's discovery or recognition of "slack" in the system has made it possible to bring theory into line with reality and show why the production and expansion of capital goods may move in direct correlation with consumption goods instead of adversely; going up with increasing consumption and going down with decreasing consumption.

The second conclusion is that the statistical study of "lags" in this correlation shows that *the initial change usually takes place first in consumption demand.* "We have found that in most cases changes in business conditions appear to have originated in forces affecting the output of goods destined for consumption." (page 71.)

But if we grant to the Brookings men adequate proof or verification of the two conclusions above, then the whole theory of the business cycle, so far as it relates to production and consumption, or saving and spending is concerned must be radically revised. If the initial movement, whether in the direction of recovery, prosperity or depression, takes place in the demand for consumption goods, then it follows that any approach to successful operation of the industrial machine, at or near capacity, involving the possibility of plenty, calls for a first and major concern over the maintenance of adequate purchasing power in the hands of those whose incomes are in the lower brackets because they spend a higher per cent of their incomes for consumption goods than do those who are the recipients of high profits.

Such findings play havoc with the high-profits-low-wages theory of prosperity and capacity production. Capital, available from high profits may *set* labor in motion, but only sustained consumer demand for con-

<sup>5</sup> Moulton, H. G., "The Formation of Capital," page 4.

<sup>6</sup> *op. cit.*, page 28.

<sup>8</sup> *ibid.*, page 43.

<sup>7</sup> *ibid.*, page 35.

<sup>9</sup> *ibid.*, page 48.

sumption goods can *keep* it in motion. This is because the demand for capital goods is only a *derived* demand—more capital needed to supply a higher demand for consumption goods—but the demand for final consumption goods is a primary demand and when adequately sustained, sustains the whole productive process.

Upsetting as Moulton's conclusions are to the generally accepted ideas about business cycles and sources of prosperity, the writer is inclined to concur in his conclusions. He has always felt that there was something wrong with the general idea that the capital goods demand was the essential one to watch and sustain as it held the key to prosperity; that when consumer demand lags all we need do is to float bonds to buy more capital goods to produce more capital goods to create more capital goods. It impresses him as involving about the same difficulties as those facing the four boys who locked themselves in a room one rainy day in order that they might all get rich trading pocket knives.

A final query remains to be answered. Is it not true, say the classicists, that the consumer demand is relatively constant, whereas the demand for capital goods is highly variable? The curve of business activity in general is far more closely identified with the curve of capital goods activity than with the curve for consumption goods. To this query, Moulton says:

"The mere fact that the curtailment of business activity during the course of a depression is very much greater in connection with the construction of plant and equipment than in the output of consumption goods in no way indicates that the capital goods industries are the pivot around which the economic system revolves. The moment the demand for consumption goods declines—for whatever reason—the demand for capital goods declines also *and in vastly greater proportion*. A slight shrinkage at the base of the pyramid very nearly eliminates the top." This happens because the capital goods demand is almost wholly for replacements, it being obvious that if the plant capacity was adequate for prosperity, it needs nothing additional to care for depression demands.<sup>10</sup>

Furthermore, a small change of consumption goods is serious to employment and volume of business. This is because it is such a high per cent of the total volume of business. It is estimated that the total production for the year 1929 was eighty-one billions, seventy billions of which consisted of consumption goods. That ratio is close to the usual one. This means that as a rule 85 per cent of our volume of production is for consumption goods and 15 per cent for capital replacement and expansion. From this it follows, of course, that if there is a shrinkage of five billion dollars in consumer de-

mand, the curve would fall less than 6 per cent, while a drop of five billions in capital goods demand would be 33 per cent, yet the actual loss in consumer demand would create as much unemployment, and have the same depressing effect upon the market for raw materials, as the far more striking depression in the capital goods industry. In other words the repercussions from what appears to be a very slight drop in consumption are quite as serious with respect to labor, agriculture and other producers of raw materials as the far more striking shrinkage in the capital equipment industries.

Finally, turning his attention to the decade of the twenties, Mr. Moulton discovered what he believed to be three tendencies, all of which contributed to the disequilibrium which led to the 1929 debacle and the depression following. "First, the tendency of money savings to increase faster than consumptive expenditures; second, the failure of new plant and equipment to grow as fast as money saving; and third, the dissipation of excess money savings" in competitive bidding for securities at higher and higher prices.

He apparently agrees with John A. Hobson that there is a sort of golden or ideal proportion between saving and spending. If that proportion obtains and both increase along together at the proper ratios, all is well. Speaking concretely, he says that in the early twenties the funds available for investment in capital equipment, or such as could be plowed back in the industry were eight or nine billions and most of it was used for that purpose. In 1929, savings available for investments had jumped to fifteen or sixteen billions, but business men, keeping a watchful eye upon the effective demand for consumption goods, did not deem it profitable to reinvest their entire savings in additional capital equipment, and continued reinvesting only about eight or nine billions. "What became of the money savings which did not eventuate in new plant and equipment? The answer is that, aside from that portion which went into foreign issues, the excess savings were absorbed, dissipated in bidding up the prices of outstanding securities."<sup>11</sup>

In the concluding chapter of the volume on "The Formation of Capital" Professor Moulton throws down the gauntlet to all proponents of classical economic theory with respect to saving and spending, and like Martin Luther he nails his theses on the door with a clearness that no one may mistake his meaning. He stands ready to defend them against any and all comers. By way of challenge, he says:

<sup>10</sup> *ibid.*, page 72.

<sup>11</sup> *ibid.*, page 151.

"According to the traditional analysis the amount of new capital goods that will be created depends merely upon the proportion of the national income that is set aside in the form of savings. When individuals save money instead of buying consumers' goods, they express a demand for capital goods; and it is assumed that in response to this demand new capital goods will shortly be created. To produce such capital goods however, it is necessary to shift labor and materials from the creation of consumption goods, this being accomplished by the operation of the so-called price and profit mechanism. The curtailment in the demand for consumption goods is matched by an increase in the demand for capital goods, and the resulting fall in the price of the former and rise in the price of the latter serve to induce a shifting of productive energy in response to changing profit opportunities.

"In accordance with this analysis all the productive energies of society are employed regardless of how the total money income may be apportioned as between consumptive expenditures and savings for investment. . . ." From this "it follows that the greater the proportion of the national income that is saved, the greater the growth of capital and the more rapid the rate of economic progress."<sup>12</sup>

In reply, Moulton says:

"We challenge the assumption that money savings enter the market as direct demand for capital goods. We contend that such savings merely constitute a supply of money available to business enterprisers for use in the construction of new plant and equipment. Whether it will be profitable to use such funds in the formation of new capital depends upon the possibility of selling (profitably) the commodities which such capital can produce. The demand for capital goods is *derived* from the demand for consumption goods. Hence, an increase in savings *at the expense* of consumptive demand will decrease rather than increase the output of capital goods. . . . If new capital is to be created there must be an increasing flow of funds through consumption channels as well as through savings channels. . . . (And) the facts show incontrovertibly that new capital is constructed on an extensive scale when consumption is expanding rather than when it is contracting."<sup>13</sup>

If the findings of this study are correct and valid, then, J. B. Say and his famous doctrine of markets, together with all those who have adhered to it during the past hundred years are in fundamental error. Production does not finance consumption, and keep the economic machine in motion, regardless of the personal distribution of income, or the proportion between saving and spending, because purchasing power is always in the hands of someone and either the insatiability of human wants for consumption goods or the lure of profits from capital goods will induce them to use it.

The distribution of the national income and proportion between spending and saving has definite bearing upon economic progress and the ability to maintain a high level of production and consumption. With re-

spect to the prosperity years of the 1920's "A larger relative flow of funds through consumptive channels would have led not only to a larger utilization of existing productive capacity, but also to a more rapid growth of plant and equipment. . . . The primary need at this stage in our economic history is a larger flow of funds through consumptive channels rather than more abundant savings."<sup>14</sup>

IV. *Solving the Riddle of Income Distribution and Plenty.*—After being told by the Brookings men, in their third volume, with categorical finality, that the smooth and full operation of the economic machine is dependent upon relatively less saving, and more spending for consumption; that since high saving comes from those with large incomes, it follows that the only way to increase the ratio of consumer spending to capital saving is to shift a part of the national income from the incomes in the higher brackets to those in the lower bracket; i.e., give more money to those with incomes around \$1,000 to \$1,500.

We awaited with eager anticipation, the suggested technique by which this miracle or slight-of-hand performance was to be accomplished, for we were pretty familiar with J. B. Clark's "Final Productivity Theory of Wages" that wages were governed largely by an economic law and in the long run could not exceed the specific value of the specific product resulting from a laborer's effort. In other words, it takes more than wistful wishing to increase incomes in the lower brackets.

It appears, however, that Professor Moulton and his associates also knew something about the laws of wages and in the final volume on "Income and Economic Progress" they bring forward a proposal for increasing income in the lower brackets that is not in conflict with the principles of economic science.

Furthermore, their ingenuity is still more strikingly revealed by using the major portion of the book to expose popular fallacies and tell us how consumer demand from the smaller incomes *cannot* be increased. We shall present them with only the briefest comment, leaving the reader to consult the original discussion, if he so desires.

1. *Expansion of Foreign Markets.*—If there appears to be a supply of investment funds in the hands of the rich beyond that which can profitably be employed in capital equipment at home, then turn to investments abroad and finance the expansion of exports. In this way plants could be operated at capacity and labor fully

<sup>12</sup> *ibid.*, page 156.

<sup>13</sup> *ibid.*, page 157.

<sup>14</sup> *ibid.*, pages 159-60.



employed, and no maladjustment or stoppage need arise. But that plan was tried on a vast scale for ten years following the war and with disastrous results. Hence it needs no further serious consideration.

2. *"Share the Wealth Program."*—*The Proposal of Wealth Equalization.* If wealth were all in monetary form, securely filed away in the lock-boxes of the nation's banks, then it would be physically possible to equalize wealth and it *might* have some social merit, but wealth is composed primarily of farms, factories, mines and railroads. To divide them up and share them is to destroy or decrease their value and effectiveness. Many cannot be divided without being destroyed. Therefore, the capital levy as a means of equalizing wealth is not the path to plenty, even for the poor man.

3. *Taxation and Public Enterprise.*—It is difficult to prove that money collected through tax channels and expended through government channels creates more employment, or gives greater income to the poor than private enterprise. Public enterprises undertaken solely, or primarily, to create a market for idle labor and raw materials is part and parcel with the "make work" fallacy and should be roundly condemned by all economists. Government expenditures should be undertaken and financed, either from the proceeds of taxation or the sale of bonds, *only* when "the goods and services which would thus be produced would yield to the American people greater satisfactions than they would derive from the goods and services which might be produced with the same expenditure of funds and energy through private enterprise."<sup>15</sup> With Moulton's ideas as expressed here, economists and those trained in the lines of scientific management, will find it easy to agree.

4. *Raising Money Wages.*—The conclusions in volume three had led us to suspect that Moulton would champion this thesis. The high-wage-purchasing-power theory has won many advocates and is most alluring. Yet Moulton rejects it and gives his reasons clearly. First, higher wages do not as a rule yield higher purchasing power. If the bargaining power of employers is strong enough to keep wages low, then when forced by labor or government to raise wage rates, their bargaining power with the consumer will be strong enough to raise prices. In fact, if prices have been kept in line with costs through effective competition, it will be impossible to raise wage costs without raising prices, and if it is monopoly with which we have to deal then be

assured that increased costs will be passed on in increased prices, *especially if we relax the anti-trust laws.* Experience with the NRA has proved that "in the majority of instances price increases ran ahead of wage increases." (page 105.) Verily, what doth it profit a man to get a 10 per cent increase in money wages, when accompanied with a 15 per cent increase in the cost of living?

But, whereas, labor does not gain in real wages by increases in money wage rates, all groups lose that are tied to fixed incomes, whether by statute as government employes, or by custom.

The most fatal result, however, of trying to give greater income and effective demand for consumption goods to those in lower income brackets by wage increases, is its conflict with that obstinate old rascal, *demand and supply.* Governments may set minimum wages, and strong labor unions may demand the union scale or withhold supply, but it must never be forgotten that *the wage problem is a price problem*, and the higher the price of labor, the fewer the number of units of labor that will be purchased.

The writer is no proponent of sweatshop wages, and there may be some merit to the suggestion that wage rates be kept high in times of prosperity when labor is quite generally employed, lest consumer purchasing power weaken, and capital equipment be left idle. But to propose a general increase in the price of labor in the midst of a dire depression when ten million men are unemployed—to propose an increase in price, when at the prevailing price the supply exceeds the demand by ten millions—approximates the acme of absurdity in the field of economic affairs. Professor Moulton does well to warn us against this popular fallacy. Truly, the law of demand and supply presents stubborn opposition to our well-laid plans. It is no wonder that a prominent politician (not in Louisiana) said recently that one of the first laws which congress and the state legislatures should repeal is the "law of demand and supply." Its operation is so disconcerting to demagogic proposals.

5. *The Chart of Plenty.*—Before passing on to consider what Moulton believes to be the correct method of distributing income and placing additional purchasing power in the hands of consumers with low incomes, it seems expedient at this point to present and evaluate the findings of the National Survey of Potential Product Capacity as set forth by Harold Loeb and his associates in "The Chart of Plenty."

Space will not permit a reproduction of the many tables, charts and arguments by which they arrive at

<sup>15</sup> Moulton, H. G., "Income and Economic Progress," page 95, Brookings Institution, 1935.

their conclusions, but going directly to the point they say that capitalism functioning through the open-market, competitive system under the spur of profits does not, and cannot, sustain the economic mechanism at capacity production, or high-level consumption. This is because "Profits can be made only when the effective demand equals or exceeds the available supply of goods for sale."<sup>16</sup>

Employers are caught between the necessity of paying *low wages* in order to stay in business with their competitors, and of paying *high wages* in order to provide a market for their goods. "The contradictions inherent in the open-market system compel employers to cut the national income and impoverish the nation in order to save their financial necks." This is the dilemma inherent in competitive capitalism. From this it follows that "either the present system of rewarding labor must be discarded, or the plant and personnel must be operated at two-thirds speed, or one-third unneeded productivity must be diverted into waging war, preparing for war, or some new large-scale speculative undertaking whose nature has not yet been envisaged."<sup>17</sup> When faced with these two alternatives "It would seem that the simple and obvious way out, that of giving a buying power adequate to procure desired goods and services to the limit of our ability to produce them might well be tried." (page 161.)

Now for the plan. First, there must be a Board of Scientific Managers with the combined functions of seeing what the capacity productive power is, and then operating at that level, while laborers and other consumers are supplied with money enough to buy these goods. Mr. Loeb does not stress the necessary concentration of power, yet their plan necessitates the creation of a Board of Administration with absolute power not surpassed by Mussolinian Fascism, as the following four-point plan clearly indicates:

"To create a buying power commensurate with our ability to produce and our need to consume seems to require: (1) that goods and services be divided (by the board) into two classes: those no longer necessarily scarce, and those intrinsically scarce (which need not be further considered);\* (2) that the prices of the former be fixed (by the board)—at any price level—and totaled; (3) that the total price (budgeted quantities multiplied

by unit prices), translated into monetary terms, be issued (by the board) to the prospective consumers and canceled when exchanged for goods and services; (4) that the industries concerned with producing and distributing these non-scarce goods be centrally controlled (by the board)<sup>18</sup> so that the budgeted quantity of goods (subject, of course, to unforeseeable variations in consumer demand) shall be produced. These four measures would seem to solve the economic problem insofar as its engineering aspects are concerned."<sup>19</sup>

"The Chart of Plenty" has received superlative praise by no less an authority than Charles A. Beard, who unhesitatingly says of it "This is the most important book of the twentieth century that has come within my ken." In the light of this comment one hesitates to offer the following criticism, but frankness and intellectual integrity require it, and without further hesitation we make bold to say that this book only reveals how extremely foolish great engineers can appear when they presume to write a serious work dealing with the science of economics. Lest one be held guilty of prejudice we submit the following proof.

"Scarce vs. Non-scarce goods." What in the world does Mr. Loeb and his associates mean by goods "intrinsically scarce" and those "no longer intrinsically scarce," and further that we would continue to allow scarce goods to be regulated by open-market competition, but the price of non-scarce goods we would regulate by planning boards, who would fix the quotas to be produced, the prices at which they would sell, and issue enough monetary tickets to consumers to get them all sold and consumed? Now when is a good scarce?

From the statement made by Loeb, one would be led to believe that a supply curve was a horizontal line; that out to a certain point goods would be scarce, beyond that point they would cease to be scarce. The economist, on the other hand, knows that the science of economics cannot be handled intelligently without first defining a few terms. One of the first distinctions necessary to make is the difference between free goods and economic goods. Free goods are those which exist in quantities sufficient to satisfy all wants at a price of zero. They have utility but are not scarce. Economic goods do not exist in quantities sufficient to satisfy all wants, therefore the price is above zero. They have utility and are also scarce. *Therefore, there is not a single good with which economists, producers, or consumers concern themselves, but goods of the scarce type.* Scarcity is a relative term, not an absolute one. At one

<sup>16</sup> Loeb and Associates, "The Chart of Plenty," page 160, Viking Press, 1935.

<sup>17</sup> Loeb, "The Chart of Plenty," pages 160-161.

\* Loeb's own footnote on this point is as follows: "Goods intrinsically scarce could and probably would be left to the open market system since no socially useful purpose is served by fixing their prices or controlling their production. This is due to the fact that competitive selling is an aid to technical advance only before the problem of production has been solved. After the problem of production has been solved, competitive selling is conducive to organized sabotage in the form of restriction of production."

<sup>18</sup> NOTE.—The words "by the board" inserted in the parentheses above were not in the book, but placed there by the writer of this article, because they are inherent in the plan.

<sup>19</sup> *op. cit.*, page 162.

price supply is in excess of demand, at a lower price it is not. The demand for every economic good is greater than supply if the price is low enough. In other words demand and supply are economic terms and are mathematical functions of price. An engineer who looks about him and sees a large mass of unsold goods or goods that are moving slowly calls them "abundant," or not affected with scarcity. Others, he sees going like hot cakes and calls them scarce, not seeming to realize that every economic good would go like hot cakes if only the price were lowered sufficiently.

The second absurdity in their proposition is that *scarce goods* would be regulated by open-market competition the same as now. Only non-scarce would be controlled and priced by the economic dictator. But from the analysis above, it is clear that all goods with which economics is concerned are the *scarce* ones. Therefore had he defined his terms rightly, all goods would be governed by open-market competition and there would be nothing for the board of planners to do. What a beautiful illustration of the way in which a disagreement evaporates when terms are rigidly defined!

But granting to these engineers a sufficient degree of occult power to distinguish scarce goods from non-scarce goods at some other point than that which distinguishes free goods from economic goods, and then have the abundant goods regulated, fundamental difficulties arise. The success of securing balance between production and consumption at capacity with plenty for all, depends upon two factors; first, the wisdom of the planning board to get quotas and proportions properly arranged, and secondly, enforcing upon the members a willingness to consume at those ratios at the prices set by the planning board. Whether Mr. Loeb and his associates are aware of it or not, their plan has already been tried and the verdict of history is against it. One was by Robert Owen with his National Equitable Labor Exchange established in England in 1832. To guarantee that workers would always have as much money or purchasing power as was required to buy or effectively demand all that was produced, workers were paid in labor-time notes, and the price of each commodity was equal to the labor-time money, given to the producers, yet goods came to glut the market and could not be sold because the workers who possessed the money felt that in many instances the goods were priced too high.<sup>20</sup>

The writer is familiar with another attempt to balance capacity production and capacity consumption by the use of quotas and a planning board by the Amana Society in Iowa. The writer has made many visits there and had long conferences with the chairman of the planning board. The board fixes the proportions for goods to be produced, prescribes the order of consumption, including food, clothing, housing, etc. In all fairness to the experiment, we would say that it had largely eliminated all worry about the future. There was great contentment and happiness, possibly beyond that experienced by the majority under capitalism, but by no conceivable stretch of the imagination could it be called an economy of capacity production and plenty. Lacking the stimulus of competition and freedom of enterprise, the pace was exceedingly deliberate, production low with inadequate capital facilities, revealing "the simple life" with both its blessings and its curses. Furthermore, they had problems of discipline, and willingness to do as the planners directed. It worked in a measure because the membership was voluntary. To attempt to force any such a degree of planning and central, fascistic control throughout the whole of American industry is unthinkable and of course not permitted by the American Constitution.

V. *The Final Solution—Distributing Income through Price Reductions.*—After carefully presenting and critically appraising the various proposals which Moulton deems to be in error, he then presents as valid the proposal for an increase in income and consumer purchasing power, through *general price reductions*. This he calls "The Competitive Method of Distributing Income." American business men may seek to add to their private riches, either by the way of monopoly, which utilizes the principle of scarcity and monopoly price or, business men may seek to increase their private riches by following the efficiency principle under competition. In fact the only path which competitive business can successfully follow is the efficiency principle. Competition sets the price, and only those succeed who get volume of business. Since the increase in efficiency which is responsible for the reduction in costs commonly involves an expansion in productive capacity, the wise alternative obviously is to expand sales by offering the products at a lower price. In short, increased efficiency *makes possible* lower prices, while the profit incentive (under competition) *insures the actual reduction* of prices. The greatest profit to the enterpriser is thus derived through giving to the masses the most for their money. The interest

<sup>20</sup> For a fuller statement and criticism, see the Chapter on Robert Owen in "Value Theory and Business Cycles," by H. L. McCracken, McGraw-Hill, 1933.



of the profit-maker, therefore, coincides with the welfare of the consumer.<sup>21</sup>

*The Universal Benefits of Price Reductions.* The price reduction method of distributing income has an outstanding advantage over other methods in that the benefits are extended automatically to the entire population. Increased money wages may aid the labor group which actually receives the wage increase, but they injure everyone who has to pay the higher prices. Larger production and lower prices help all who consume the goods.

This method of distributing income is particularly helpful to the farm population. The latest census shows 44,636,770 classified as farmers. As a class they have had the lowest income of any important group in the nation. The per capita income of the farm population for the United States as a whole even in 1929 was only \$273.<sup>22</sup> Raising money wages and prices only makes their plight worse. But the price-reduction method automatically extends its benefits to agricultural and non-industrial small town population. The same would be true of that large group of professional workers and salaried men whose incomes are of the relatively fixed type. They constitute that great middle-class group that absorb terrific punishment by the high-wage-high-price policy, but would be effective demanders for far more goods if industry followed the path of efficiency and competitive price. Sharing income by price reductions would not handicap manufacturers who produce for export markets. The high-wage, purchasing-power plan decidedly does. "The greater the technical progress and the lower the consequent selling price the greater will be the chance of expanding foreign sales. The adoption of a policy of distributing benefits of progress by means of progressively lower prices rather than by means of advancing wages—particularly if adopted by all countries—would enormously clarify and simplify the problem of international competition.

"The broad highway along which continued economic progress must be sought is the avenue of price reduction."<sup>23</sup>

VI. *Final Appraisal and Criticism.*—It is probable that many who have followed carefully and hopefully through the extended study made by the Brookings men, set forth in four volumes, have been disappointed when the climax of the study is reached in Chapter VIII of the final volume on *Income and Economic Progress*. What a simple solution! "*Share the wealth*

*and distribute more real income to the lower income groups by increased efficiency and decreased prices.*" Surely the mountain hath labored and brought forth a mouse.

Additional response might be that prior to the Roosevelt regime with its New Deal formula of higher wages, higher prices, and scarcer products, the economic pattern was exactly what Moulton and his men are now proposing. Yet it ran amuck. Was not the Mellon-Coolidge-Hoover regime characterized by rugged individualism, freedom of enterprise, amazing increases in efficiency and competition? Does not private capitalism, functioning under the guidance of the automatic forces guarantee the very kind of income distribution which Moulton proposes?

With some reservations, the answer is "Yes" if it is *sufficiently competitive*; if there is *sufficient freedom of enterprise*; if individuals are *sufficiently rugged* to be willing to meet competitors on the basis of efficiency and price, instead of scampering for shelter under the same tent in order to agree upon production policies and price, and avoid the rigors of competition. On this point Professor Moulton says:

"The development of trade associations in the 1920's was systematically encouraged under the leadership of the United States Department of Commerce. Indeed 'stabilization' was one of the fundamental policies of the Hoover regime—the stabilization of prices being regarded as a means of preventing disorganization and hence as a key to stable production and permanent prosperity.

"The evolution of industrial policy in recent times has thus served in substantial measure to prevent or impede the functioning of the competitive price mechanism. That is to say, over an ever-widening segment of the economic system the process of persistently expanding purchasing power by means of price reductions (as technological changes drove costs downward) has been checked. Thus one of the primary agencies of adjustment upon which the capitalistic system was supposed to rely has in substantial degree ceased to be operative."<sup>24</sup>

As a result of this drive on the part of business men for stabilization through trade associations, and finally for outright repeal of anti-trust legislation, "the necessity of progressive price reductions as a means of expanding purchasing power and markets appears to have been forgotten, alike by business managers and economic statesmen. The conclusion is inescapable, however, that in so far as the effort to stabilize prices is effective the broad distribution of income upon which continuous economic expansion depends is circumvented."<sup>25</sup>

<sup>21</sup> Moulton, H. G., "Income and Economic Progress," page 118.

<sup>22</sup> *ibid.*, page 123.

<sup>23</sup> *ibid.*, page 126.

<sup>24</sup> Moulton, H. G., "Income and Economic Progress," page 138.

<sup>25</sup> *op. cit.*, page 140.

It appears therefore, that the Mellon-Coolidge-Hoover industrial regime had little in common with private, competitive, capitalism. The visible hand of monopolistic price and production control had been widely substituted for the invisible hand of flexible price in the presence of competitive supply and demand. If this be true, then this simple looking prescription of the Brookings men is one of vast import and far-reaching significance.

In fact, it is probable that the medicine here prescribed is a pill altogether too bitter for American business men to swallow, after having tasted the sweet meats of group agreement and unified action. Stuart Chase was probably right when he said of a certain group of employers, "Apparently they were more afraid of competition than of federal control."<sup>28</sup> It is not infrequently true that those who shout most loudly for rugged individualism and freedom of enterprise are smugly sheltered behind some kind of "Pittsburgh Plus."

The writer's final verdict is that Brookings Institution has probably presented the soundest economic proposal that can be made whereby private capitalism can approximate most nearly to capacity production and maximum consumption. It is true that it has little in common with the New Deal program of general scarcity and higher prices. Fundamental weaknesses are already appearing and much of the program will doubtless disappear, either by court order or by general consent.

On the other hand, the proposal has little in common with monopolistic combinations and Hoover stabilization plans. Should business revert to that idea, Capitalism can be expected to stagger from one impasse to another till a new rebellion occurs which will carry the nation to more complete regimentation, either Socialism or Fascism.

Capitalism has been severely wounded in the house of its friends,—the "relax-the-anti-trust-laws" men. Its future health and security lies in a general return to healthy, wholesome, competition, with emphasis on efficiency and lower prices rather than upon scarcity and higher prices. Business men would do well to give more time to "scientific management" as first set forth by Frederick W. Taylor, and less to combinations in restraint of trade. Taylor never assented to the need of following the scarcity principle. He steadily maintained that the unmet needs of consumers were too great; that the rapid discovery and adoption of greater

efficiency would not cause supply to exceed effective demand, provided only that producers shared the gains with consumers in the lower prices which these discoveries made possible. These are the conclusions of Moulton and his men and the present writer still believes in the fundamental validity of that position.

---

(Continued from page 36)

of scientific management and in guiding efforts in its application along right lines to a higher plane. To be of value it is not necessary that a paper deal only with something totally new; it is just as important to clarify understanding with respect to the old and to bring back into the picture important aspects of scientific management which have been lost sight of as well as to interchange experience in its application.

---

(Continued from page 41)

myth. They are desirable and they are possible, but they are possible only as functions of centralization.

It may be that our courts will declare that we established a constitution which does not permit adjustment and regularization under the authority and guidance of a central government; that we made a constitution so rigid that we must endeavor in a modern complicated society to pursue the ends and employ the means of nearly a century and a half ago. There are many business men so blind as to hope that the courts will so declare—witness the replies to the recent questionnaire of the Chamber of Commerce of the United States. If they do so declare, it appears inevitable that the orderly progress which has been in the background of our minds this evening will not be realized; that it will be disorderly—possibly become very disorderly. Functional necessity laughs at constitutions and courts that refuse to recognize the solid facts of the evolution of human institutions, and refuse to be flexible and adjustable.

---

## REVIEWS

*The Triumph of Mediocrity in Business.* By Horace Secrist, Bureau of Business Research, Northwestern University, Evanston, Illinois, 1933, pages xxix, 468.

The main point in this work is that individual businesses under present conditions of competition and free enterprise do not continuously improve, but rather tend to mediocrity. The statistical

<sup>28</sup> Chase, Stuart, "Government in Business," page 1, Macmillan, 1935.

studies upon which this conclusion rests were made on information drawn from department stores, retail clothing and retail hardware stores, wholesale grocers, banks, railroads and agriculture.

Professor Secrist starts with the assumption that practice and repetition should lead to improvement in business as in personal ability. Using reports of expense figures and of net profits as measures of efficiency, he finds that practice and repetition do not in fact lead to continuous improvement in business, but that concerns with low expense rates tend in time to show increases in expenses and, similarly, that concerns with high expense rates gradually reduce them. Both extremes, therefore, tend towards a middle, or modal, result. As Professor Secrist puts it: "They tend to regress to type."

There are several practical implications in this study. Professor Secrist thinks that the time may have come for setting up mathematical tables forecasting the expense and profit possibilities, and, indeed, the mortality rates of private business concerns. On the basis of such knowledge new entrants into business could be forewarned and forearmed against the chances of failure they would encounter. Successful concerns already established, when faced by the facts concerning these trends, could perhaps take more vigorous measures to prevent regression to their respective types.

Professor Secrist evidently intends the study to be a criticism of the present competitive system for its failure to develop higher and higher forms of efficiency. If so, he does not point out what type of economic system would better serve this purpose. This reader would have been pleased to learn whether Professor Secrist thinks there is any radical remedy for the trend he has described, or if, indeed, there may be any remedy at all.

The statistical work in this volume, while of the highest grade, uses raw materials which might perhaps be challenged. The samples drawn from the retail fields are, in the opinion of the writer, not only limited, but biased. No account was taken of competitive concerns that rose and fell during the period under consideration. A study of the expense rates among concerns that failed would have proved a useful addition. Moreover, the period covered by these studies, 1920 to 1930, was, for the retail trade, a period of rising costs of operation. It is true that expense ratios increased, but probably not in full proportion to the increases in costs that occurred in such items as labor, rent, advertising and supplies. Retailers fought very hard during these years to keep their expense rates down. Had there not been such vigorous effort the expense ratios would have gone much higher. There may be room for an assumption that the groups of concerns studied by Professor Secrist all made relative advances in efficiency. If they had not done so the costs of retail distribution to consumers would have gone much higher.

Professor Secrist's book is heartily recommended to thoughtful students of both business and economics. It is in no sense an elementary book. The reader must be able to use his head as he goes along. Whether he will agree or not, is not so important as the stimulation he will find in this book. By PAUL H. NYSTROM, Professor of Marketing, Columbia University, New York.

*The Art of Conference.* By Frank Walser, Harper & Brothers, New York and London, 1933, pages x, 305. (\$3.00.)

Mr. Walser has based his book on extensive participation in conferences, including groups of Mohammedans in Egypt, employers and employees in Paris, diverse groups in America, and international progressive education and Quaker relief. He has been influenced by the emotional and philosophical background of Slavic thought, by the quiet efficiency of the Quakers, and by the extensive work on conference method, particularly that of the Inquiry. To the groundwork of others he has added some original contributions in this stimulating book.

The author thinks that there are more and more tasks at which men cannot create alone, but must create and plan together. Humanity is pressed to choose between a chaotic mass of conflicts and systematic methods of co-operation.

Tracing democracy back to the methods of the village meeting, Walser urges that the democratic method of discussion and integration of conflicts be chosen rather than the trend to propaganda and autocracy. Not only vast new distances, but the vast new complexity of information must be bridged. "The study group, the research committee and the conference table will take the place of the old meeting house." A naive faith in experts is not enough; their facts and interpretations must be communicated and evaluated. Solutions to problems are in the nature of an invention and often arise from the synthesis of different points of view.

Walser sees conference methods not only as an educative force for social change, but also as modifying the individual. He points out "how useless it is to change the institutions unless the character of the individuals, particularly their habits of meeting all sorts of conflicts and their manner of examining fruitfully their own personal inconsistencies are improved." The conference method is creative when the individuals are participating not only with the surface of their active minds but with the emotional depths of their whole personality.

The author gives many important points on the technique of preparing for and holding a conference, the part of the chairman, and so forth. The special point of technique which he stresses is the proper use of "pause" or "silence" of a minute or two, to allow conferees to think out what they have heard and assimilate it to their own trains of thought. These pauses sometimes facilitate an integrated group opinion.

The function of leaders is to introduce new vision and express latent tendencies. They can supply facts and a trained chairman, and advance the processes by which individuals and groups can become inventive, creative and well informed. Finally, the conclusions of many groups can be combined into a few forceful decisions affecting wider groups.

The book has in parts a somewhat mystical flavor which is quite likely to antagonize those who are impatient with a religious attitude. On the other hand, what he says has been carefully criticized with the intellect, and is close to the position of the psychologists who stress the importance of the integration of the whole personality. Walser thinks that the resolving of conflicts in the individual citizen's mind is an essential part of social progress if violence is to be avoided. By MARY CUSHING H. NILES, Consultant in Management, Baltimore.



2

&  
x,

in  
n-  
nd  
as  
nd  
by  
of  
me

at  
co-  
ass

et-  
nd  
oa-  
ast  
dy  
ke  
is  
ni-  
of  
ent

ive  
He  
the  
ing  
lly  
er-  
ing  
the

of  
air-  
he  
or  
and  
me-

ress  
air-  
ups  
the  
ful

n is  
re-  
are-  
of  
tion  
of  
of  
ING